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INTERNATIONAL CLINICS:

A QUARTERLY OF CLINICAL LECTURES

ON

MEDICINE, NEUROLOGY, SURGERY, GYNÆCOLOGY, OBSTETRICS, OPHTHALMOLOGY, LARYNGOLOGY, PHARYNGOLOGY, RHINOLOGY, OTOLOGY, AND DERMATOLOGY,

AND SPECIALLY PREPARED ARTICLES ON TREATMENT.

BY PROFESSORS AND LECTURERS IN THE LEADING MEDICAL COLLEGES OF THE UNITED STATES, GERMANY, AUSTRIA, FRANCE, GREAT BRITAIN, AND CANADA.

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Drugs and Remedial Agents.

OPIUM: ITS USE AND ABUSE.

BY HERMAN D. MARCUS, M.D.,

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GENTLEMEN,—Opium is the inspissated juice obtained from the papaver somniferum, a native of Oriental countries. It is an annual plant, about three feet high, the capsule of which is smooth and round, and about three to eight inches in diameter. Different varieties of this plant are known, but the white and black are the ones most generally preferred, especially the white, which seems to have a greater amount of the juice distributed throughout all its parts, and specially abundant in the capsule. It is obtained by making free incisions into the unripe capsule and permitting the juice escaping to accumulate around the edges of the incision. This is then left for about twenty-four hours, after which period the juice is scraped off with a blunt knife, collected in small vessels, and, after mixing the product with saliva, wrapped in the leaves, and thus brought upon the market. According to the country in which the opium-plant is found, we name the Turkish, Persian, Indian, or Egyptian variety. Chinese opium is a variety most generally cultivated in Mozambique.

The great demand for this drug has caused the adulteration of it, and it is well to be guided by the following rules to recognize an unadulterated preparation,—namely, pure opium should break with a sharp, notched fracture, should leave an interrupted line when drawn across white paper; it should be of a soft, greasy constituence, have a slight nauseous and bitter taste, and a strong narcotic odor. It is easily inflammable, and yields its virtues to water, alcohol, and dilute acids, but not to ether. The United States Pharma-

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copœia directs that the main alkaloid, morphine, should be found in quantities of not less than nine per cent. in the moist opium.

Opium contains a number of alkaloids, the most important of which are morphine, narcotine, codeine, theabine, papavarine, narceine, laudanine, pseudo-morphine, protopine, and an acid,—the meconic acid. Of all of these alkaloids, it is morphine and codeine which demand the closest investigation and study. Morphine, the most important of all these constituents, appears as colorless, or white, shining crystals, or cystalline powder, odorless, of bitter taste, alkaline reaction, slightly soluble in cold water, soluble in five hundred parts of boiling water, in one hundred parts of alcohol, and thirty-six parts of boiling alcohol. Its presence is recognized by a number of tests; among others, nitric acid reddens a solution containing morphine, the color changing to yellow. With ferric chloride morphine yields a blue color, changing to green if an excess of the reagent is added. With cold concentrated sulphuric acid it should yield a colorless solution. Morphine is the true hypnotic constituent of opium, and should be found in the dried opium in from thirteen to fifteen per cent.

Codeine is most generally found in combination with meconic acid, and may be separated from morphine by an alkaline solution. It occurs in white or yellowish-white translucent rhombic prisms, is odorless, and of slightly bitter taste. It is soluble in eighty parts of water at 59° F., in seventeen parts of boiling water, freely soluble in alcohol and chloroform, and soluble in about six parts of ether. The preparations obtained at apothecary shops are most usually contaminated with morphine. The test for pure codeine is: Dissolve it in sulphuric acid, when a colorless liquid should result, which, on addition of a trace of ferric chloride and gently warming it, becomes of deep-blue color.

Opium may be classified as a hypnotic, a narcotic, an analgesic, an antispasmodic, a tonic, a diaphoretic, and a diuretic. If opium is taken in small medicinal doses, the first effect noticeable is that of a general feeling of quietness and rest. Most usually we find a decline in the activity of the mental faculties, although it has been repeatedly observed that in some persons, who have a peculiar idiosyncrasy against this drug, the mental faculties may become markedly excited. After a short time, varying according to the peculiarities of the patient, the hypnotic influence of opium is observed, the sleep

produced being either light and natural, or of a heavy and stuporous character, depending to a great extent upon the previous condition of the patient, the mode of administration, and the amount of the drug taken. After the hypnotic influence of this drug has worn off, we may observe quite frequently a state of depression pointing most markedly towards the gastro-intestinal tract, and such symptoms as headache, nausea, vomiting, and even purging have been repeatedly observed to follow the administration of even very small doses of opium. If these small doses be continued over a longer period, all these symptoms may become exaggerated, and we may reach a stage in which administration of small doses of opium may either prove very harmful or be of no benefit at all. When medium large doses are taken, the symptom of well-being becomes markedly exaggerated, and we may then find a great similarity in the symptoms, with effects similar to those resulting from the taking of cannabis indica. Visions of a pleasant character, dreams during which images and scenes which have a tendency to revive the patient's spirits, have been quite frequently noted, and it is especially this stage which helps the patient not yet a fully confirmed opium fiend to fall into the habit of taking the drug regularly.

If very large doses of opium are taken, the primary symptoms may be entirely lost, the patient immediately relapsing into a deep sleep, markedly resembling coma. We observe then a flushed face, a pulse bounding and strong, skin usually dry and warm, although at times cold and clammy, respiration slow and stertorous, and the significant symptom of opium-poisoning,—namely, contracted, pin-point pupils. All these symptoms resemble to a great extent cerebral congestion. The coma is deep, and it is only with the greatest difficulty that the patient can be roused, only to again relapse quickly into his former state. If the patient is permitted to remain in this condition, he very soon becomes prostrated, the coma grows still deeper,—in fact, so deep that arousing the patient is an impossibility,—the respirations become slow and feeble, the face is pallid, the pulse becomes rapid and more feeble, the skin *always* cold and clammy, and the pupils, which during the entire stage has been markedly pin-point, suddenly dilate,—the symptom of death. If death occurs, it is always due to failure of respiration. This is the usual course of a typical case of acute opium-poisoning, but it is by no means the only effect observable when dealing with toxic doses of opium. Decided

prostration, the symptoms referable to the brain, such as dull headache, vertigo being especially exaggerated, nausea, and vomiting, may be profound, especially when the patient attempts to rise from a recumbent position; coma, however, may not be so profound, only a general drowsiness being apparent, but, instead, convulsions may be present. One of the most common symptoms noticeable in the administration of large doses of opium is a severe pruritus.

Upon the heart opium acts in small doses somewhat as a tonic, recognized by the full and bounding pulse; but its administration, if long continued, causes depression, and in turn a feeble and slow pulse. The question whether opium acts directly upon the inhibitory cardiac nerves is answered by the fact that we unquestionably have an increase in the arterial pressure, demonstrated by the slow and full pulse. The pulse of the third stage of opium-poisoning is probably due to paralysis of the peripheral vagi.

Upon respiration opium has a decided influence. It is a direct poison to the respiratory centres. The formation of carbonic acid gas, so peculiar in opium-poisoning, is due to the direct influence of opium upon the muscles, as may be recognized by the fact that during coma an increase of the gas has been observed, while in such cases of opium-poisoning, during which violent movements are observed, the amount of carbonic acid gas is decreased. Contraction of the pupil, always present in opium-poisoning, is due to a stimulation of the oculomotor nerve-centres, the dilatation observable just as death ensues being caused by paralysis of these centres.

The question of the action of opium upon the kidneys is one still under discussion, but practically it is recognized that wherever there is a decrease in the amount of urine, as, for example, in chronic Bright's disease and uræmia, opium is contraindicated. Upon the intestines opium acts in small doses by diminishing the peristaltic movement; in large doses, by increasing it.

There is probably no drug which has such a wide range of usefulness, and no drug which is more generally abused, than opium, or its alkaloid, morphine. The tendency of the physician to use or prescribe these drugs as a ready means to overcome pain and many other symptoms especially benefited by opium has only too often proved the first step towards the acquisition of a habit destroying in its influence.

Paregoric and laudanum are household remedies to-day, and the

most ignorant layman recognizes their value as pain-destroyers. It seems to be the first drug thought of when the infant cries; when the adult suffers. Again, the physician with a hypodermic syringe always at hand is only too often too ready to administer the alkaloid, obtaining temporary relief, satisfying for the time being the patient, without any thought that this dose may be the beginning of a career of morphomania. Paregoric, or the camphorated tincture of opium, is a household remedy, and, owing to the ease with which it may be obtained, lacking in few homes, is made use of on the slightest occasions. Again, infant remedies, such as patent medicines and proprietary drugs, employed as soothing syrups, contain a greater or smaller percentage of the preparations of opium. Despite its general use, people at large are entirely ignorant of the maximum dose permissible or of the ill effects and results following its administration. A child suffering from colic or crying while teething becomes soon quiet by the administration of paregoric or one of the "soothing syrups." The administration of two or three doses, to achieve this result in a short time, is by no means rare. As a result the child becomes quiet and falls asleep,—a sleep from which it may never awaken. The mother, perhaps tired with assiduous attentions to her babe, is not quite as close an observer as she usually is, and sees in that sleep nothing more than a rest naturally following excitement. Only too late may she realize that something may be wrong; the physician is called in, perhaps, only to find the child dead. Again, we may find a constitution weakened by the continued administration of opium, a stomach and intestinal tract disturbed by this drug, digestion only imperfectly performed, and, as a result, the many diseases the etiology of which may be referred to as gastro-intestinal disturbances, perhaps emaciation, eruptions of the skin, and the thousand and one symptoms which are quickly passed over as the result of improper feeding, but which, if closely looked into, will be found quite often to be due to the inability of an opium-drugged stomach to perform its proper function.

Again, the effect of opium upon the brain of the infant is one not to be overlooked. There is no question that continued administration of any one of the preparations of opium has a tendency to depress the brain-functions, and you will quite frequently observe that children habituated, so to speak, to the use of opium are duller than the average child of their age.

As to the adult. At first perhaps only a small dose of opium or its alkaloid is given by the physician to his patient, with the intention to alleviate some pain. With the knowledge of its prompt action, the patient, recollecting the beneficial action of this particular medicine, will take one or more doses upon his own responsibility. Recurrence of this pain for a certain length of time will gradually cause an habitual taking of the drug, without any thought or any knowledge of the nature of the medicine. The patient will finally reach a stage where the drug becomes a necessity, when, whether in pain or free from it, there will be a craving, a desire, to take the drug, and if not taken, a depression so marked may follow as to even cause general prostration.

Again, insomnia, so frequently found in brain-workers, men of intellect, calls for the hypnotic influence of opium. After its ingestion finding that the desired result is quickly obtained, on future occasions the drug may be again resorted to, to give much-needed rest, until, finally, without it, sleep becomes an impossibility and the result a fully established habit. There are so many ways in which this habit may be acquired that it is impossible to enumerate them, but one particular method, being of such common occurrence, especially in the Oriental countries, it may be well to mention,—namely, the smoking of opium. Opium as it is smoked by the Chinese is rolled into a small ball, probably the size of a small pea, placed in the pipe the bowl of which is heated over a flame. The effect upon first smoking opium is entirely different from the experience of confirmed opium-smokers: at first there is extreme nausea, followed by a stupor which is associated with hallucinations of a very unpleasant character. Floating apparently before the eye are visions and images hideous to behold. This, in turn, is followed by a gradual quietude and sleep. When this habit is continued these symptoms change. There is with the first inhalation of the opium fumes a feeling of well-being, a sensation of rest, appearances of most pleasant and beautiful images and visions, and, in general, a condition which to the weak is an incentive to the further use of the drug.

Opium-eaters, opium-smokers, and, in fact, all persons addicted to the use of this drug soon present a very peculiar appearance. The face is sallow, the eyes are brilliant but sunken, the body emaciated, the skin dry and harsh, the mental faculties become dulled, and the person, if before its use honest and upright, soon becomes the reverse.

Immorality to the extreme is always observed in opium *habitués*. The desire to get the drug becomes so strong that he will stop at nothing to obtain it, theft being considered a very legitimate way of procuring the desired article. An opium *habitué* is a person upon whose veracity you can never rely, and to use the words of one of our best-known American practitioners, "The opium fiend is always a liar."

The treatment of this habit is exceedingly difficult, and it may be said that it is almost impossible to cure the opium habit if the moral support of the patient cannot be obtained. All cures advertised, or attempts by the legitimate practitioner to cure opium habits, fail in every case in which the patient's consent has not been fully obtained. The treatment that some physicians advise—namely, the gradual withdrawal of the drug and giving in its place another stimulant such as strychnine—may prove of some success, but only temporarily, because no sooner does the patient leave your hands than he will gradually turn to his old habit, even if there is not the actual craving for the drug. But if the patient's support is assured, the treatment is usually simple, and success always follows it.

It is of the greatest importance that the patient shall be removed from all baneful influences and placed entirely in care of his physician, preferably in a sanitarium or hospital, or, if this is not feasible, in care of a conscientious and firm nurse. Sudden withdrawal of the drug is contraindicated, it being preferable to simply reduce the daily allowance without the actual knowledge of the patient as to the amount taken. The quantities which an opium *habitué* can use are astonishing, and it is advisable, even with the moral support of the patient, to still keep him in the belief that these large quantities are administered. Where the patient has become addicted to the use of the hypodermic syringe filled with morphine, hypodermic injections should be continued, decreasing the actual amount of each injection, and substituting for it some stimulant, such as, for example, the nitrate of strychnine. Hygiene becomes of great importance; the surroundings should be made as pleasant as possible, and the patient given all opportunities to distract his mind. A very favorite method of treating the opium habit is the preparation of a solution of opium or morphine, and with each dose taken out add an equal amount of water. The withdrawal of opium in this way—

namely, gradually—is not attended with the unpleasant and often dangerous symptoms associated with the sudden withdrawal of the drug. It has been quite frequently noticed that prostration and even collapse were apparent, and the physician was forced to return to the administration of opium. Other symptoms, such as vomiting, diarrhœa, and insomnia, are quite frequently associated in the treatment of the opium habit, but may be very quickly overcome. Therapeutically coca may be administered by the mouth. Massage and electricity and proper feeding, consisting of highly nutritious and easily digestible food, are advisable. For the gastro-intestinal disturbances, bismuth and astringents may be prescribed.

In the treatment of acute opium-poisoning, promptness is necessary. Evacuation of the stomach by the administration of emetics, such as the sulphate of zinc, mustard water, or hypodermic injections of apomorphine, should be furthered. The use of the stomach-pump will prove of benefit. Stimulants, both respiratory and circulatory, must be given, and such drugs as strychnine, aromatic spirits of ammonia, and nitroglycerin may prove successful. Alcohol, while of great benefit, should be used with the utmost caution. Small doses will show no effect; large doses may increase the stupor. The patient must not be permitted to sleep. He should be walked about continually, and slapped or rubbed with towels rung out of ice-water; if necessary, galvanization should be applied, or massage. The physiological antidotes for morphine or opium are atropine and belladonna. Lately, permanganate of potassium has been used with undoubted success. Atropine when administered should be given in doses of one-hundredth of a grain for each half-grain of morphine taken, and continued cautiously until respiration is improved, or until it is noticed that the pupils begin to dilate; *not* until the pupils are fully dilated. Permanganate of potassium may be given, well diluted, in amounts equal to the amount of the poison taken. Recognizing that opium kills by failure of respiration, artificial respiration by any one of the known methods may be employed, a very favorite one being that of the drawing out and pushing in of the tongue at the rate of normal respiration, some sixteen to twenty times a minute; Dr. Fell's method of opening the trachea and forcing in air by mechanical appliance has proved of success in desperate cases. Treatment should be kept up indefinitely, or rather, until the patient is actually dead. It has been shown repeatedly that

when all hope was given up, but the treatment still persisted in, recovery followed. One point well to remember is that in causing vomiting to remove the drug from the stomach care must be taken that a sudden inspiration should not draw any of the vomited matter into the air-passages, and if such has unfortunately occurred, tracheotomy may be necessary. The use of the catheter and administration of quick-acting purgatives or rectal enemas may be found of advantage.

Externally, opium may be applied to sprains or bruises in the form of laudanum or some liniment containing the drug. Painful ulcers and chronic rheumatism are alike frequently ameliorated by the application of lotions containing opium. Topical applications of morphine dissolved in glycerin may be of great benefit to relieve the distressing cough due to irritation of the throat in phthisis. Painful inflammations of the skin are ameliorated by the application of laudanum and hot water. In nasal catarrh and hay fever, a combination of morphine with cocaine will prove of great benefit to relieve pain and irritation. Internally, opium, or one of its preparations or alkaloids, is administered to produce sleep; but care must be taken that it should not be given in any condition in which congestion of the brain is present. Various colics, such as renal, hepatic, or uterine, are relieved by the hypodermic injection of morphine, and the pain associated with angina pectoris is quite frequently diminished by this drug. Morphine or opium added to cough mixtures will have a great tendency to allay irritation usually associated with cough, and its action in diminishing secretions will tend to relieve the cough in the third stage of bronchitis. Delirium associated with acute infectious fevers is always quieted by the administration of opium, especially if combined with tartar emetic. Neuralgias of various kinds are quite frequently improved by local applications or hypodermic injections containing this drug; in fact, in all conditions associated with excessive pain, opium or morphine proves of service. In diabetes mellitus, opium proves of the greatest benefit, diminishing the quantity of urine excreted, the amount of sugar, in fact, ameliorating all symptoms associated with this disease, and in this disease, as well as in different forms of cancer, opium can be taken in quite large doses. Diarrhœa and dysentery, especially if attended with cramps, are alleviated by the administration of opium internally or in the form of a suppository. Its effect as an antispasmodic is

recognized by its prompt action in epilepsy, tetanus, whooping-cough, and chorea. Surgical shock is quickly overcome by hypodermic injections of morphine. Night-sweats so frequently associated with phthisis are quickly checked by a combination of ipecac and opium, the well-known "Dover's powder."

Apomorphine is not an alkaloid of opium, but a derivative of morphine. It is classified as an emetic, and is obtained by adding twenty parts of hydrochloric acid to one part of morphine and exposing it to a high temperature. It occurs in colorless crystals soluble in water and alcohol, but insoluble in other menstruums. As an emetic it can be used in doses of one-tenth to one-sixth of a grain, and if given in small amounts proves of benefit as an expectorant, especially in the treatment of bronchitis with little or no secretions, in which cases it will quickly overcome this symptom. As an emetic it is most usually administered hypodermically, as it seems to have absolutely no emetic properties if taken by the mouth, and William Murrell found that as high as two-grain doses could be safely taken internally without even exciting nausea.

It has been recommended in the treatment of strychnine-poisoning, and Dr. Samuels speaks highly of its value in one-forty-eighth of a grain doses, every five or ten minutes, until vomiting occurs in spasmodic croup.

In conclusion, it would be well to say that we frequently find patients unable to take opium, or any one of its alkaloids, even in most minute doses, so that even the very smallest quantity of opium may produce very unpleasant and even dangerous symptoms, in which cases it is important to use other drugs similar in their action.

Treatment.

THE TREATMENT OF PULMONARY TUBERCULOSIS.

BY NORMAN BRIDGE, A.M., M.D.,

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THE reason why a person gets tuberculosis is that his usual power of resistance to the microbes of this disease, or rather the normal power of resistance, has been reduced in some part of his body. A damaged kidney or bladder, or joint, bone, or periosteum, or the delicate tissues of the cerebral membranes or of the lungs, may be the part involved. Considering the vicissitudes of the lungs in their functionation in the varying conditions of life and environment, it should cause no surprise that they are so frequently affected. It is surprising that the lungs are so little prone to disease.

That the bacilli tuberculosis are everywhere, and are taken into the bodies of nearly all people, is now well enough demonstrated; also that they permeate nearly all parts of the system, so that they may easily develop and multiply in any organ whose vitality is reduced or where some other condition invites the disease.

How long the system can endure the presence of tuberculosis depends on the amount of damage done to important organs, and the rate at which the poison of the tubercle bacilli and other microbes thriving in the lesions gain admission to the circulation and become disseminated through the system to damage the blood and lower the vitality of the organs.

If the general system is not invaded, the tuberculous process may be endured indefinitely in a non-vital part, as in certain regions of bone; or in a circumscribed spot of lung tissue when the lesion is segregated from the rest of the lung by fibrous tissue. In many cases of pulmonary tuberculosis exactly this state of things exists for long periods of time, and the patients pass for fairly or quite healthy people.

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Just what the lessening of the resisting power consists in is a mystery, although some, with a great show of reason, insist that it is attended with certain changes in the corpuscular elements of the blood, but whether as cause or concomitant is as great a mystery. Certain it is that slight lowering of vitality in organs of certain persons invites the starting of the disease, while vastly greater lowering in others never leads to it,—all of which means that there is a personal susceptibility to the affection. A great desideratum of future study is to learn the basis of this idiosyncrasy, to be able to diagnose and perhaps counteract it. That it rests to a considerable degree in some influence that is hereditary is well enough proved, but that fact does not help to a discovery of its more intimate basis, nor greatly help to its correction.

While a vast number of people die of consumption or pulmonary tuberculosis, and a majority of cases cannot be cured or saved by any means whatever, the minority that may be saved by the proper course is so respectable in size that there is great encouragement to do for them all, for now and then we are surprised to find some case that seemed hopeless get well. Our duty, therefore, lies in resorting, at the very beginning of each case, to all those measures that promise anything for the patient. And one of the greatest services we can possibly render the sick is to watch every pulmonary patient with such assiduity that we may discover tuberculosis in its very incipiency and take prompt measures against it. To a large number of patients promptness means recovery; delay means death. There is hardly another disease of the *genus homo* of which this is so true as of pulmonary tuberculosis; verily it is like a fire in a city, the way to stop it is to attack it in its beginning.

The proper treatment of pulmonary tuberculosis consists in efforts (1) to increase the power of the patient to resist the bacilli; (2) to improve the local conditions, prevent an extension of the disease to new regions, and cause healing of the ulcerations; (3) to prevent or counteract the effects of the poison circulating in the fluids of the body; and (4) to destroy the bacilli, or render the system uncongenial to their growth.

To increase the power of the patient to resist the bacilli of tuberculosis is, in the light of present knowledge, incomparably the greatest service ever rendered him, and it means more in treatment and requires more care and skill than anything else, and than all else.

It is not only the one thing most necessary, but it is often all that is necessary. How can it be accomplished? Unfortunately, the measures usually are restricted to the administration of that class of drugs known as tonics. Many times, on account of the poverty of the patient, this is about all that can be done, and it is not to be disparaged, for tonic medicines do increase the powers of life and of resistance to disease, more especially in patients who have not a predisposition to tuberculosis.

It is a most surprising fact that many cases of incipient phthisis are hardly benefited a particle by any tonic treatment. In spite of it the appearance of anæmia continues, the hands and feet are cold, damp, and purplish, the digestion is poor and the vitality low. This shows that we yet want some tonic that can under such circumstances arouse the nutritive and protective powers of the system, or counteract the effect of some influence or thing that is inimical to the perfect physiology of the system. The thing necessary is to increase the powers of life that are normal to the system; these powers are never to be lost sight of; our efforts do not create powers, but only energize them.

Tissue-building and replenishing must be one of the functions of these powers, and tissue-depuration another, while quite as important a one is the protection of the structures from the pathogenic microorganisms that forever surround and imperil us.

With these powers at their perfection, and working in entire harmony with each other, almost anybody can, with the aid of the conservative reaction of the tissues to irritants, recover from a localized tuberculosis of the lungs; without these conditions very few ever recover under any influences. How to insure these conditions in cases where they have been disturbed is the paramount consideration.

The occupations of people and their environments more or less depress the vitality of the body. For health occupation is almost a necessity, yet nobody quite succeeds in so balancing his work with the other influences that affect him as to live in a highly hygienic way, and most people do not succeed at all in doing it. The first step in the treatment of all cases is to relieve this burden if possible. The patient is bodily and mentally fatigued by the constancy and monotony, if not by the severity, of his work and life, even if they are not otherwise unwholesome. A complete rest and change are

always desirable if they do not entail any countervailing injury, such as discontent and lonesomeness. Probably all other measures combined are not as valuable as a complete change of climate, with cessation of work. The energies and faculties that have been employed are fatigued; the change relieves them, and the very rest leads to a restoration and rejuvenation of them, and the taking on of new strength by a weakened organ or faculty increases the vigor of every other part of the organism. This latter truth is axiomatic.

Then the natural elements that surround every person, since they are rarely perfectly adapted to the wants of the system, need to be varied. They bear too heavily on certain organs and parts, and a change of climate often alters this completely. Sometimes the air is too moist or too dry, too hot or too cold, and even slight changes in the atmospheric pressure, due to changes in altitude or the movements of storm-centres, may harm or help a patient perceptibly, so that any change to a climate not positively harmful is usually a benefit, and a change to one mild enough to enable the patient to live out of doors and sleep practically in the open air is always a benefit. It is impossible to create an in-door atmosphere as healthful as that out of doors, and patients should be urged to breathe this constantly, and it is possible to do it in a mild climate.

Probably the change in food and drinking-water involved in a change of climate does not count for as much as the variation in air and scene—the moral influences—but it may count for something. Anyway, it is true as a clinical fact that the right change of climate is more potent to rest the overworked powers; to shift the heavier physiological burdens to other powers and organs; to energize the debilitated and unused ones, and through all these to cause an increment of vigor to the whole organism for health and resistance to disease, than all other influence whatsoever.

What are the best climates for consumption?

One of the qualities of the best climate is that it enables the patient to live much of the time an unhoused life. It therefore must for the weaker invalids be not very hot nor very cold; vigorous patients can endure, with the aid of much clothing, quite cold weather, and sometimes be benefited by it, but to many it produces after a few days a sense of weariness, which is a detriment.

Dryness of the air seems to be an advantage, although it is of distinctly less value than is usually supposed. It reduces the amount

of expectoration, chiefly by lessening the mucus and serum of it, often without reducing to any degree the amount or progress of the ulceration or infiltration of the tissues.

High altitude is an advantage in many incipient cases, for the reason, as most believe, that it leads to a more complete expansion of the lungs, a thing that is always useful. But the benefit is probably more owing to a general improvement in nutrition due to the change in atmospheric pressure inducing some unexplained increase of the powers of life. There can be little doubt that a voluntary deep inspiration every half-hour during the waking time of the patient will do for any one as much good as the deeper inspirations of high altitudes. High altitudes, moreover, cause in time marked nervousness in some persons. The truth is that altitude is simply a radical part of the change in climate, which is the important thing; doubtless a case of tuberculosis developing in it would improve as much by going to a lower level.

The right behavior in a new climate is quite as important as the climate itself. Contentment, out-door life, warmth of clothing and rooms, sleeping in rooms perfectly ventilated, long hours of rest and sleep, nourishing food, strictly moderate physical exercise (short of any lasting fatigue), and a residence in the new region months and years enough to get all the benefits it can give; these are the great requisites, and it must be said in sadness that most patients fail of half of them. If they are gaining, they exercise too much, and wrongly suppose the more muscle they develop the more nearly they are well. Every grain of uselessly developed muscle is an ounce of obstacle to recovery from the tuberculosis. They clothe themselves insufficiently in the cold weather, stay in cold rooms often, and breathe house air contaminated by outlandish heating devices and by lack of ventilation. Cold-catching is their great bugbear, and they will not learn, as many doctors do not, that fresh air, cold air, drafts of air, never cause cold-catching so long as the body is warm. Tent life gives the wholesomest air of all, but most people are afraid of it. In cool and cold weather especially are patients afraid of being out of doors without exercise. Yet they can sit out in the wind with impunity if they are sufficiently wrapped for warmth.

The American regions having the desirable climatic qualities referred to in the highest degree are, it is hardly necessary to say, Colorado, Arizona, Utah, New Mexico, and Southern California.

The last, including its sea-level desert, unquestionably has the greatest variety of climates of any of these regions.

Then, although a complete change of scene ought to do most invalids good, and conduce to pleasure and contentment, many of them will fret and worry and be homesick unless they have about them some of their family or friends. Truly, there is no disease quite as vexatious and incorrigible as nostalgia, and it is the accentuation of cruelty to send an invalid off to a strange land alone if he is likely to have it. It usually passes off in time if the patient lives, but its depressing influence often loses for him what chance he otherwise might have of overcoming his tuberculosis. A tuberculous patient with a narrow margin of certainty of recovery cannot afford to make a mistake. The worst mistake of all, and the one usually made, is, on any marked improvement in a new climate, to rush back into the very climate and all the conditions of work that produced the disease originally.

The best tonics are iron, quinine, strychnia, mineral acids, alcohol, and oils, and they should be given with the greatest possible regularity and system, and varied from time to time as occasion requires; and large doses should be avoided, as they tend to disturb the digestion, which must be conserved at all hazards.

Foods should be selected for their digestibility, and decomposition and fermentation in the stomach and bowels be prevented as far as possible. Consumptives with good appetite usually eat too much, more than they require or can digest. They proceed on the theory that the more you eat the more strength you will have, which is nonsense. The result is, food decomposes in the alimentary canal and irritates the mucous membrane and induces ptomaine-poisoning and diarrhœa. A restricted diet with perfect digestion is sufficient, and especially with the little exercise such a patient should take.

Little can safely be done in the way of antisepsis of the alimentary canal except by creosote, guaiacol, oil of cloves, and the like, and it is probable that the only good these agents do for tuberculous patients is in this manner. They disagree with a minority of the patients, but the majority can take them with impunity, if not with benefit. That they are inimical to the bacilli tuberculosis in the lungs is unproved. Guaiacol has been used of late as an external application to lower the temperature in fever, but after repeated personal observations of its effects, and notwithstanding the fulsome praise of it by

a number of observers who are on record in its favor, I am satisfied it has no power of any consequence in this direction. It is not an anti-pyretic of any value, if at all, and is not worth using. Salol is unsafe as an antiseptic in any but very small doses. It is alleged that kou-miss is an intestinal antiseptic of value, which I hope is true. Mineral acids to some of the patients are not only good tonics but one of the best intestinal antiseptics, perhaps through their action in the stomach in destroying microbes there which otherwise might find their way into the intestines. Salicylate and subgallate of bismuth are valuable for temporary purposes, especially in temporary diarrhœa.

One of the most harmful dietetic impulses of these patients is that, like children, they desire to make their diet of fruits and raw vegetables, articles that contain but a trifling amount of nutriment, are difficult of digestion, frequently produce acescence and diarrhœa, and quite effectually prevent the eating of sufficient nourishing and easily digested food. The foods that are most nourishing and digest-ible are stale bread and crackers, milk and things made of milk, raw or soft eggs (the curdled or jellied egg is the best), and tender meat, that is, animal food. Any one who can eat and digest these really needs no other aliment, and all consumptives are better off when restricted to them. Patients thrive for many months on a diet of stale bread, scraped raw meat, and water, and do not find it specially difficult to take, if they only resolve to try and take it.

There is probably some nexus between the effects of alcoholic tonics and a predisposition to pulmonary tuberculosis, for a majority of patients with the tendency cannot take whiskey or wine in any amount; these disturb the stomach, flush the face, and heat the body, and the patients rebel against them. On the other hand, those who have better nutritive powers, less tendency to the disease, and can take whiskey in moderation regularly, more often recover. This drug is frequently taken in too large doses—one or two tablespoon-fuls is a sufficient potion—and with an amazing fatality it is usually taken nearly clear, whereas it should always be diluted with sixfold to tenfold of water. Whiskey agrees with more sick people than any other form of alcoholic tonic, but it is vicious to take it according to the whim of the individual. It should be taken like any other medi-cine, at prescribed intervals and in fixed doses.

Cough is perhaps the most disturbing symptom to the patient,

and the popular wish to have it stopped is something amazing; even when it regularly brings up large quantities of phlegm, the demand to have it checked is incessant. Cough mixtures are the most sought after of all drugs, and people will not readily learn the normal purpose of this symptom. Cough is a most conservative effort of nature to rid the respiratory passages of offensive matter the retention of which is bound to do harm by decomposition and absorption, and is one of the chief causes of fever in most cases of consumption. The fever with the cause of it sooner or later wears out and kills the patient; patients whose microbic products are all expectorated mostly recover; where these products are imprisoned in cavities and must be absorbed, death usually ensues.

Deep breathing should always be encouraged for the purpose of freeing the tubes, and if a deep inspiration causes a cough it is proof that it is necessary. Cough mixtures—anodynes of any sort to check cough—should only be given when the cough is harassing and fails to bring up phlegm, or when it is positively painful. Such drugs are required occasionally for pleuritic pains or for neuralgia in the chest walls, and those least disturbing to the digestion should always be chosen. Codeine is better than morphine or other preparations of opium, and often some sharp counter-irritation of the chest wall, as by tincture of iodine, croton oil, or a small blister, or a succession of small blisters, will relieve the pain effectually and obviate the necessity of anodynes that may disturb the digestion and cause constipation. Frequently an aggravating cough, ascribed to a tickling of the throat, may be promptly checked by some pungent substance taken into the mouth or swallowed, as a little cubeb, capsicum, lemon-juice, or a taste of camphor or of whiskey. Occasionally a gargle of some astringent, as alum or tannin, may stop it; or some inhalation of steam or the vapor of menthol or terebene, eucalyptol or compound spirits of ether, the iodide of ethyl, or some similar substance. The inhalants probably go direct to the spot of irritation; the things swallowed and gargled doubtless act solely by reflex action from the pharynx.

Many patients are in constant fear of hemorrhages, whether they ever have them or not, and a few drops of blood even will alarm them. As a matter of fact, few patients have extensive hemorrhages, and fewer still die directly of the bleeding. Those who have repeated small bleedings do better on the average than any other cases

of equal severity; the loss of blood lessens congestion in the parts involved, while it suggests the superficiality, to the bronchial surface, of the lesion. Nothing need ever be done for a small hemorrhage; it will usually stop spontaneously in a few minutes. Large bleedings require efforts to check them, but it should be borne in mind that usually there is more mucus and serum expectorated than blood, so that a small bleeding looks formidable to the patient,—it is all blood to him.

Ergot is utterly useless as a remedy in hæmoptysis, and the inhalations sometimes lauded for this purpose are hardly of any consequence at all. Incomparably the best drug is opium in some form, morphine being the best, and it should be used hypodermically, and there is no need of giving a large dose, a quarter-grain is usually enough. The patient should be kept recumbent and still, and on a low diet if the hemorrhage is extensive, and for several days after it is over, and violent exertions of all kinds should be avoided for a long time, although moderate exercise that does not greatly accelerate the heart's action may be perfectly proper.

Cinctures drawn tightly about the thighs and arms at the juncture with the body are useful by lessening blood-pressure in the vessels of the chest.

Local treatment to improve the condition of the lesion, prevent its spread, and cause its healing is of all things desirable. Unfortunately little can be done in this direction. Nature usually promptly infiltrates the lung with fibrous tissue about the circumscribed lesions, thereby preventing to some extent the spread of the disease. This is a conservative process, and always occurs in the cases that recover. As the infiltration invades normal lung tissue it, of course, impairs the breathing surface to some extent, and so causes shortness of breath; in recovery, therefore, there is up to a certain point a progressively increasing short-windedness that is often both a surprise and a disappointment to the patient. But he soon becomes accustomed to it, and normal portions of lung tissue gradually expand, and so it becomes less.

It is doubtful that any means are known to increase this conservative process of fibrosis; certain gold preparations often used in consumption have been recommended as capable of preventing fibrosis, as of the kidneys, skin, and spinal cord, but there is no proof of their

value in this direction, and if in tuberculosis they did prevent fibrosis it might be harmful rather than otherwise.

Numerous inhalants have been employed in the hope of destroying or repressing the microbes in the lungs and curing the ulcerations, but they are of small value, except perhaps the oil of peppermint, which probably has some destructive influence upon the tubercle bacilli if it can be endured to be inhaled constantly enough. This agent is so disagreeable when inhaled from some device worn upon the face, and for more than half the time of every day, as it is necessary to do for its full effect, that few patients have the fortitude to keep it up long.

Various balsamic preparations and antiseptics, as creosote and eucalyptol, have been inhaled with some relief from excessive cough and irritation of the bronchi, but there is small reason to think that any of them kill the bacilli, and their good effect must be chiefly upon the non-tuberculous surfaces free from ulceration. The ulcerated surfaces are most of the time covered by a layer of variable thickness of muco-pus, which effectually prevents any vapor from touching the ulcers or affecting the tuberculous surface except at such occasional moments as the masses of muco-pus happen to be driven out by a blast of air in a cough. The mono-chlor-phenol, the vapor of which is said to be heavier than air, is perhaps one of the best of the antiseptics, yet it is doubtful that it does much good; moreover, it has an odor that is extremely disagreeable.

Although fever is one of the most distressing conditions in consumption, and the temptation is strong to be perpetually doing something for it, there is little that is ever done that is really in the end useful. It is quite impossible to reduce the temperature by applications of cold water, as in the essential fevers; the patient would rebel against such treatment even if it were useful. The modern antipyretics of the class of antipyrin and phenacetin can rarely be employed with comfort to the patient, for if a sufficient dose be taken to reduce the temperature very much, such profuse perspiration ensues as to cause as much discomfort as the fever does. Then it seems to be shown by the experience of the sick that such artificial reduction of temperature, resorted to every day for many months, as it often must be if the fever is kept down, does not increase the prospect of final recovery, which is the supreme test. The great desideratum is some means to prevent the cause of fever, which is

the absorption of the products of the tuberculosis and of the pus formation consequent upon it. If we could only devise some means of extruding these substances from the body as fast as formed, and keep them out of the circulation! Where the tuberculosis is confined to the surface of the bronchial mucous membrane, or is so near it as to enable the patient to expectorate freely nearly all products of the disease, no fever of consequence occurs. But unfortunately in a majority of cases pus is imprisoned in the bronchi and cannot be expelled, and so absorption goes on and, as a consequence, fever occurs, and we are nearly powerless to prevent either. Deep inspirations sometimes help a little by carrying air beyond the deposit and causing its expulsion by coughing, but only a little.

Where high temperature causes headache or neuralgic pain, it is proper to give moderate doses of phenacetin, acetanilid, or other similar antipyretic.

The night-sweats are a great source of discomfort to the patient, but they do not harm him as much as he thinks. Whenever the fever drops suddenly, sweating follows, and the sudden dropping is characteristic of poisoning with such products as are developed in this disease. There is strong reason to think that the discomfort is much more produced by the conditions that cause the sweating than by the latter itself. There are few medicines that can prevent the sweating, —atropine is the best of them all,—and when used often the discomfort from the drug is nearly as great as that produced by the perspiration. It is always wise to assure the patient that the sweat is harmless, and if he can believe it he will experience in that more benefit than he can from any or all drugs to prevent it. But the patient usually will not believe it, for it is fixed in the popular mind that the contrary is true, and popular beliefs usually stay.

Patients who sweat profusely are best clothed in thick, loose, porous woollen stuffs, thereby reducing the discomfort and danger of chilling. The ball-players and athletes have demonstrated the value of the "sweater," and for the perspiring patient the same or similar conditions should be reproduced as far as possible.

Pathologists have searched long and still search for some cure for tuberculosis that is directly antagonistic to the disease, wherever it may be in the body. A few physicians still use Koch's lymph in the belief that the patients are benefited by it, but the consensus of opinion is strongly against it. Several chemical modifications of it

have been employed with more success than the unmodified lymph, and with moderate evidence of their value. There seems to be a persistent impression in certain quarters that, although this lymph is the product of the tubercle bacilli, and is probably the identical substance the patient is casting into his blood in varying amounts constantly as a result of the disease, it still ought in some way to kill the bacilli and cure the disease, provided the deleterious substances it contains can be eliminated and the useful ones preserved; hence the ingenious efforts at modifications of its composition. Of these agents the antiphthicin and tuberculocidin of Klebs are probably the best. They prevent the spread of tuberculosis in animals, and are somewhat useful in human subjects. They may be taken hypodermically or by injection into the rectum. Dr. Paquin has introduced in this country the treatment by subcutaneous injections of the blood serum from horses rendered immune by repeated injections of Koch's lymph, claiming that it is inimical to the spread of the disease and the growth of the bacilli. A somewhat extensive use of this agent leads me to the conclusion that it has moderate power against the disease. It is an aid to the resisting power of the system if it does not happen to irritate the skin and subcutaneous tissue, or induce a momentary faintness, which accidents occur in a small proportion of cases. The majority of patients take it with trifling discomfort in ten- to sixty-drop doses once a day, and if it is fresh and aseptic it produces no systemic reaction. But it does little towards destroying the bacilli in the bad cases, for they are found after months of use of it, and must render its chief service by aiding what resisting force there may be in the system. If it shall remain as a valuable remedy, it will be chiefly in the early cases where the normal forces of the system are nearly enough to enable the patients to recover, and a little assistance will tip the scales in the right direction. But it is in just such cases that we are always in doubt whether the patient might not have recovered without the remedy, and so there is always the element of uncertainty.

The hypodermic use of nuclein deserves a more thorough trial than it has yet had; good results already recorded create the hope that in this substance we have a valuable remedy.

The chloride of gold and sodium, from which much has been expected, is probably simply a tonic to the system, and, as such, worthy of confidence. Iodine used subcutaneously has possibly

some power to aid the system to resist the disease, and if it is dissolved in oil it can be taken without great discomfort. Perhaps iodine introduced into the system in any other way would be as valuable, but to take a large dosage of this drug uncombined and by the stomach often means a considerable disturbance of digestion, which it is important to avoid.

There is a notion among both the laity and the profession that a cavity in a lung is not only incurable, but mortal, which is about as true as that other belief that a lung may be wholly consumed and gone and the patient live for years. Small cavities often heal completely, while those of considerable size hardly ever do, but often become innocuous by reason of a thick layer of fibrous tissue that is formed around them, preventing the dissemination of their contents through the normal lung, while these are at varying intervals cast into some bronchus to be expectorated. Many a time a patient who has for weeks been burning with fever suddenly improves on the breaking down of a mass of lung into a cavity; the field of most active absorption is abolished, and the products of disease are expectorated. A cavity of moderate size is a thing of distinctly less menace to the system than a large mass of tuberculous lung with its absorbents taking up the products of disease with great rapidity.

A volume could be written on the complications of consumption, but it is unnecessary to discuss many of them here. Laryngeal tuberculosis occurs often in the late periods of the disease, and is a condition of the gravest possible import, for it is practically mortal and usually speedily so. Nor does anything done for it much reduce the suffering in swallowing and talking, or much prolong life. Sprays of menthol, cocaine, carbolic acid, and the like lessen the suffering a little, but none can abolish it wholly without doing more harm in some other direction. The severe applications of lactic acid and other drugs to the tuberculous spots in the larynx, by means of probangs and swabs, at times seem to do a little good, but, considering the pain involved in their use, I doubt that they, on the whole, lessen the totality of suffering or prolong life. The patient usually goes on from bad to worse, refusing food because of pain in swallowing, and retaining more of his disease products because of the impossibility of coughing efficiently; an efficient cough requires that the glottis shall be perfectly closed before the explosion of the cough, a thing the patient often cannot do.

The time necessary under the best conditions for recovery from pulmonary tuberculosis is much misunderstood; it is at least two years, more often five, even when the case is taken early, before the ulcers are healed and the cicatrices become solid and resisting, and no patient has any warrant for considering himself recovered and safe till a year has elapsed after he has ceased to have symptoms. If possible, the recovered patient should seek the most hygienic occupations, even if it does break up habits, business and otherwise, of a lifetime; a man should never put himself again under exactly the conditions that have once led to the acquisition of tuberculosis.

THE TREATMENT OF INJURIES OF THE EYEBALL, WITH SPECIAL REFERENCE TO THE PROPHYLAXIS OF SYMPATHETIC OPHTHALMIA.

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GENTLEMEN,—There is no practitioner who does not occasionally come in contact with a wound of the eyeball, and I venture to hope that a discussion of the nature of such an injury and the principles involved in its treatment may prove interesting.

And first of all, a blow on the eyeball may not produce a wound, but may yet cause serious impairment or even total loss of vision in various ways. For example, there may be serious hemorrhage into the retina, the vitreous humor, or the anterior chamber. Such a blow may cause a separation of the retina or a dislocation of the lens; or may produce disastrous consequences by disturbance of the other contents of the orbit or by fracture of its walls. These affections do not come within the province of to-night's subject. Were an attempt made to discuss in detail their differential diagnosis and treatment, our subject proper would require to be condensed into a too limited compass.

Turning to our subject proper,—wounds of the eyeball,—we find that they are capable of various classifications. They may be considered with reference to the part of the eyeball injured. Thus the wound may be in the cornea or in the sclera, possibly at that part of the sclera which is immediately over the ciliary region.

Then, again, they vary much in depth. A wound of the ball may not penetrate through the strong tunics. Thus it may be little more than an abrasion of the cornea or a tear of the conjunctiva. On the other hand, the wound may penetrate deeply, involving such structures as the iris, the ciliary body, and the lens. The prognosis

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and treatment depend on the nature of the injury, for each form of wound has its own special dangers. Of special importance are such injuries as lead to the presence of one or more foreign bodies within the eye. The prognosis in these injuries depends much on the nature of the foreign body, its position in the eyeball, its condition, and the kind of wound it has made on entrance.

To the surgeon the wounds of most special interest are operation wounds. To a large extent they are under his own control, and he can, with a considerable degree of accuracy, study the circumstances which conduce to their rapid and firm union.

Of these, perhaps the most typical and at the same time the most important is the section made in extraction of cataract. It is, therefore, the only one which I shall discuss to-night.

Of recent years there has been a growing consensus of opinion that the chief cause of disaster is sepsis. People have now largely ceased to believe that their tissues, like their souls, are possessed of original sin. Inflammation, properly so called, following an operation is no longer thought to be primarily due to some active but misdirected energy of the tissues, or of the blood, or of that former refuge of a by-gone pathology, the lymph. To most of us inflammation comes from without, the result of external agencies. Nor, on the other hand, can we call the normal processes of regeneration inflammation, even although they give rise to appearances which closely resemble it. In this restricted sense we mean that inflammation is a process which is so far self-sustaining and indefinite in its duration and extent. In the normal healing of a wound, directly the tissues are united all the phenomena of inflammation spontaneously disappear. So also in the absorption of a piece of necrosed tissue which is aseptic. As soon as the end is accomplished the inflammatory reaction subsides. By a true inflammation we mean one that tends to self-propagation. Unquestionably the regeneration of a tissue may, in certain cases, be accompanied by a true inflammation, but then it is a coincidence. We ought not to ascribe the healings of a wound to inflammatory action.

Such views are almost too universally adopted to require statement, and the septic origin of inflammation in connection with surgical wounds is all but universally acknowledged. There are still a few—although a rapidly diminishing number—surgeons who do not admit it, and who still explain the event by assuming some mis-

guided proliferation of the elements of the tissue due to causes which they do not explain. As illustrative of this, not long ago a surgeon was heard to remark that germs never did him any harm. Precisely so, but almost the next patient seen at his clinic was one who had taken a severe iritis after a cataract extraction. It was quite evident that if germs did not do the surgeon himself any harm, they made up for it by the energy with which they attacked his patients. Another patient of this same surgeon developed panophthalmitis, following a tenotomy for squint. Surely no surgeon holding the septic theory of the origin of inflammation, and operating with conscientious precautions, ever had a like experience. What, then, are the principles of operation likely to lead to success in cataract extraction? The study of the healing of a wound so far under the control of the surgeon may give important information as to rules to be observed in the attempt to obtain rapid union of other wounds. Rapid healing of the corneal section depends upon (a) the condition of the patient; (b) the condition of the instruments and of the appliances; (c) the condition of the wound.

(a) Under the first head it is well to note that the condition of the patient generally ought not to be neglected. No doubt the old idea that extraction should not be performed on patients with diabetes, or in patients suffering from albuminuria, is untrue. In both of these ailments the wound will unite in an almost normal manner. I have operated with perfect success by extraction on a patient with myxœdema, and in many other diseased conditions. Yet when a patient is weak and debilitated, it is an indication that special care must be taken. It may possibly be that an operation accompanied with even so little constitutional disturbance as this should not be undertaken.

But while the general condition of the patient is perhaps not a matter of much consequence, it cannot be doubted that the state of the eye itself is a matter of the first importance. No surgeon would now wish to operate in cases where there is a conjunctivitis or in which there is any obstruction of the lachrymal passages. It would be nothing short of culpable malpractice to operate on any patient when pressure over the lachrymal sac caused regurgitation of fluid, purulent or otherwise. The affection of the tear passages must first be remedied.

(b) Much might be said as to the preparation of instruments and

appliances. It does not, however, enter very largely into the treatment of non-operative wounds, and, therefore, I cut it short. All instruments should be thoroughly boiled on the morning of the day on which they are to be used. Immediately before the operation they should be thoroughly dipped in alcohol and ether, then for five minutes immersed in carbolic acid, 1 to 20. Finally, they should be placed in sterilized water. All dressings, drops, and lotions must be rendered as sterile as possible just before the operation.

(c) The condition of the wound is a matter of the greatest importance. Recently a great deal has been written both for and against simple extraction. Many authorities all over the world have strongly advocated a return to the old operation, without an iridectomy. Others have as strenuously argued the necessity of retaining the excision of a portion of the iris. In various hands both operations have given very satisfactory results. It is, therefore, perhaps fair to conclude that it does not make any material difference whether an iridectomy is performed or not. Personally, I have got equally satisfactory results by both methods. There is this, however, to be said, that, in operations performed without an iridectomy, there is often a tendency to prolapse of the iris. It occurs even in the most skilful hands in about ten per cent. of cases. Now, the first requisite to securing rapid union of a corneal wound is that corneal tissue be in contact with corneal tissue, and corneal epithelium with corneal epithelium. The presence of a foreign tissue between the lips of a corneal wound—such as a piece of iris or a piece of lens capsule—cannot but retard union and increase the astigmatism incident even to a successful operation. In many cases it probably leads to more serious consequences. No doubt a wound with a prolapsed iris will ultimately cicatrize, and an epithelial covering will be in time formed over the extruded membrane. At any moment the epithelial covering may be destroyed, and the iris thus laid bare may absorb septic matter. Such an accident will likely lead to a certain amount of cyclitis. This, no doubt, may be very slight, and the only indication of it may be that the vitreous humor becomes fluid and reveals several opacities in its substance. On the other hand, it may be so severe as to lead to phthisis bulbi or even to a sympathetic ophthalmitis. For these reasons I prefer to run not even a remote risk, and generally excise the iris at the time of the operation.

While, therefore, I think it advisable to make an iridectomy, I am totally opposed, for reasons which I stated at length some years ago, to a preliminary iridectomy. Nothing could well have been worse than the operation of extraction as almost invariably performed in Glasgow say fifteen years ago. The operation was performed downward and with a preliminary iridectomy. Cosmetically, and probably optically, a downward iridectomy is bad. Moreover, it is not required for the removal of cataract, although it may be in dealing with glaucoma; for I am strongly of opinion that successful operation for this affection involves the making of the iridectomy at the part of the iris which responds best to eserine, no matter where that part may be. So soon as the epithelial layer has covered the wound we are on tolerably safe ground, the only risk being that injury may reopen the wound and allow septic matter to find an entrance. Probably a conjunctival wound closes even more rapidly than a corneal, and thus it is possible that the cutting of a conjunctival flap in the making of the corneal incision is a wise precaution.

This is not the place to enter into a discussion of the statistics of cataract extraction. The septic theory of mischief, however, is proved up to the hilt to all those who are familiar with the present extremely small percentage of suppurations compared with what prevailed only a few years ago. I saw it stated the other day that in one of the large Dublin hospitals there had not been a case of corneal suppuration after cataract extraction for six years. It was in that institution that I first saw instruments boiled, and I can remember after my return the derision with which my own "culinary efforts," as they were called, were received.

We have thus, at considerable length, discussed the treatment of what we may call the typical operation wound. Success seems to depend on its being aseptic and on the perfect and immediate coaptation of its edges. It is of primary importance that no foreign tissue, such as a portion of the iris, should come between the lips of the wound. We must now discuss in some detail the treatment of wounds produced by injury.

Taking, then, those which do not penetrate the eyeball, we find that little or nothing need be said concerning those which only tear the conjunctiva; such an injury may, on very rare occasions, cause

serious mischief, but the vast majority of such accidents are unattended by any serious consequences.

The same, however, is not true for trivial lesions of the cornea; whenever the corneal epithelium is destroyed in its entire thickness, the membrane becomes liable to infection. The wounding instrument itself may implant the infective material in the cornea. Thus, not infrequently, the simple operation of the removal of a foreign body from the eye may cause a local suppuration, which in turn may give rise to what is known as a hypopion ulcer. By that is meant a purulent ulcer of the cornea associated with a collection of pus in the anterior chamber. On the other hand, the instrument itself may be perfectly clean, but the wound may become affected from other sources; of such sources there are many varieties, but clinical experience leads us to acknowledge two as principal. These are infection from (1) a purulent condition of the lachrymal passages, or from (2) an inflamed conjunctiva. Therefore, whenever a case of corneal ulcer is seen, it is the surgeon's first duty to examine carefully the lachrymal passages and the conjunctiva. If any source of infection is found in these situations he must thoroughly deal with it.

Of equal importance is the condition of the infected area in the cornea. The local nidus of contagion ought, in most cases, to be thoroughly destroyed by some form or other of the cautery. A few cases will recover without such drastic measures, but, as a rule, it is better to err on the safe side, and to apply a remedy of great value too soon than too late. The incision of Saemisch is sometimes necessary, but ought to be a last resource, for in addition to its sometimes causing disagreeable prolapse of the iris, it may open up fresh layers of the cornea to the infective process.

Accepting the views of Leber as to the origin of the pus in the anterior chamber, I have for some years past adopted, invariably, the treatment by eserine instead of atropine. From numerous cases which I have seen of recent years, and from comparative trials which I have made of myotics and mydriatics, I have no doubt as to the clinical value of myosis in such cases. If it be well established, then, probably, the filtration angle is to some extent cleared of obstruction and the products of decomposition, which if allowed to remain in the anterior chamber would determine in suppuration, escape.

So much, then, for injuries of the eyeball which do not penetrate. Those which do may be in the sclerotic or in the cornea. Of the former, it may be well to distinguish between those in the neighborhood of the ciliary region from those which are not. An injury in either the sclerotic or the cornea may be accompanied by the introduction of a foreign body into the eye. The foreign body may be lodged in the anterior chamber, in the lens, or in the deeper structures, such as the corpus vitreum or the ciliary body. In rare instances it passes completely through the eyeball, and may be lodged in the orbit. Let us first discuss those cases which are not complicated with the intrusion of a foreign body.

A corneal wound may, and, as a matter of fact, often does, cause prolapse of the iris and injury to the lens. The portion of the iris which escapes may be small or of very considerable size. Most text-books advise that when the prolapse is small, an attempt should be made to reduce it. To this there can be no objection, provided the surgeon is perfectly sure that it is aseptic. If, however, it is returned into the anterior chamber in a septic condition, it is sure to inflame. Moreover, even when the prolapse is thoroughly reduced, it is liable to recur, though a mydriatic or a myotic has been properly applied. All things considered, therefore, I believe it is better to remove it altogether. One thing is certain,—viz., if we are to obtain a rapid healing of the corneal wound and thus safeguard our patient's eye from the risk of infection, we must keep the wound free from all foreign tissue. My own practice, therefore, is to draw the iris gently out with perfectly clean instruments and to excise the prolapsed portion.

The method of after-treatment which I adopt is one which I have used for many years in the management of wounds. It consists in keeping the eye constantly bathed with a solution of corrosive sublimate. This is generally applied by means of cotton-wool, or lint pledgets, which are kept constantly moist with the fluid. For such continuous use a strength of 1 to 10,000 is ample, although some eyes will stand 1 to 8000. So soon as the wound is covered with epithelium, the moist dressing may be discontinued and one of sterile cotton-wool substituted. It is not my practice to administer either a myotic or a mydriatic. Believing as I do that the origin of all inflammations of the iris is sepsis, I do not think it necessary to use any such for so-called antiphlogistic purposes.

When the lens is injured fresh complications arise. Apart from the loss of vision occasioned by the traumatic cataract, danger is to be apprehended in three directions. There is danger from (1) the iris; (2) the ciliary body, and (3) the spaces of Fontana.

1. As regards the iris, I do not share the common idea that pressure can determine an iritis. Again and again I have deliberately needled myopic eyes for the destruction of the lens. As a rule, I make very free incisions in the lens, and have thus produced considerable swelling of that structure. Yet in all these manipulations I have never once seen a plastic iritis. I ought, however, to say that I do not count a mere adhesion of the iris to a cicatrizing lens capsule an iritis. I use the term with a perfectly distinct meaning. Iritis is an acute plastic inflammation of the membrane. Therefore, when iritis occurs after an injury to the lens, I see no ground whatever for believing that it is due to pressure on the iris. To my mind such inflammation is evidence that the wound is a septic one. Further, it can almost always be prevented by the thorough and conscientious application of antiseptic measures. It will rarely occur if the eye be kept constantly under bichloride of mercury or if it be thoroughly cleansed, and then dressed with iodoform, properly prepared cotton-wool, and a sterilized bandage. Here a word of caution should be given. The usual single bandage and lint compress, so often applied, are wholly inefficient, and ought not to be used.

2. As to the ciliary body, an obvious danger is that it also may become the seat of inflammation. The usual sign that the case is complicated with a cyclitis is pain on palpation of the ciliary body. Now, an accident of this kind may be fraught with disastrous consequences. It is quite true that exceptionally the inflammation may not be severe and that little harm may accrue to the organ. Yet, on the other hand, the consequences of a cyclitis may be exceedingly serious. It is possible that the inflammation may be purulent, and if such be the case, then, not infrequently, it will give rise to an acute panophthalmitis. In other cases there may be a sympathetic ophthalmitis in the other eye. But, short of such extreme consequences, a cyclitis may lead to serious changes in the eye affected. In dealing with the ciliary body we must remember that it has most important functions as regards the nutrition of the corpus vitreum. Almost from the beginning of exact ophthalmoscopic examinations, it was observed that inflammation in the ciliary body was liable to.

lead to the formation of opacities in the vitreous body. It was, therefore, conjectured that the nutrition of the corpus vitreum largely depended on the integrity of the ciliary body. This view has quite recently received remarkable confirmation. Within the last few years Mr. Treacher Collins has discovered a number of glands lining its posterior aspect. It seems not improbable that these glands have to do in great part with the nutrition of the contents of the eyeball. If, therefore, the ciliary region be extensively involved, shrinking of the vitreous body occurs. This is probably due to two causes. There may be from interference with the glands or other sources of nutrition a diminution of the supply of nourishment. Again, the inflammatory products which are shed into the vitreous may cicatrize. Thus, in such cases, we not infrequently find a funnel-shaped detachment of the retina. An injury which involves the ciliary body either directly or secondarily is, therefore, a serious matter.

3. A wound which involves the lens may also cause mischief from the implication of what is generally known as the filtration angle. In other words, it may cause a traumatic glaucoma. Almost all authorities are agreed that the waste fluid from the eye escapes through the fibres of the suspensory ligament of the lens, and passes into the anterior chamber. Thence it escapes by the spaces of Fontana into the canal of Schlemm. Anything, therefore, which blocks this passage will give rise to the retention of fluid in the eye, and so to glaucoma.

To Priestly-Smith is undoubtedly due the credit of having clearly expounded to British ophthalmologists this view of the origin of glaucoma. Not only was he among the first to accept it, but his splendid researches have done much to prove it. I well remember the entire change which the appearance of his first book on the subject made on the opinion till then generally received. The description of the disease was largely due to the great Mackenzie, and, therefore, it is not surprising that here, at any rate, men were slow to believe that Mackenzie's theory of glaucoma was not altogether right. Yet gradually, and in spite of a natural conservatism, the newer views came to be adopted.

Briefly put, the modern theory of glaucoma is that obstruction of the excretion takes place from the closure of the filtration angle. This is brought about by the periphery of the iris being brought in

contact with the periphery of the cornea. Priestly-Smith is of opinion that the iris is pushed forward in certain cases by closure of what is known as the circumlentel space.

Now, this shoving of the iris forward may happen when the lens is injured. So soon as the capsule of the lens is injured the aqueous humor finds its way into the lenticular fibres. These become swollen, and the increased bulk of the lens may push the iris forward either directly or else by closure of the circumlentel space. Should this happen the tension of the eyeball at once rises, there is considerable pain, and a fair amount of inflammatory reaction. Now, it is possible that even in this condition the eye may recover without interference. It will do so if the lens dissolves so rapidly that the normal excretion is re-established before much damage is done. On the other hand, if it be allowed to last too long, the nutrition which depends on the ciliary body becomes impaired and the eye will gradually soften and shrink.

The treatment which I adopt in all cases involving injury to the lens is to keep the eye thoroughly under the influence of bichloride. In certain cases, although by no means in all, I use a mydriatic. Unless for some special reason, I see no cause to administer drugs internally. Up to a certain point, then, the treatment is purely expectant. Should, however, the lens become much swollen, I no longer delay, but at once put a keratome through the cornea and withdraw as much of it as possible. In justification of this line of action, I could quote many cases which have come under my own observation. One must suffice.

F. S., a lad of about fourteen, had congenital zonular cataract. On testing his vision after dilatation and correction, I felt justified in operating. Accordingly, I needled one lens tolerably freely. All went well till the third day, when I noticed unduly deep injection, and thought that the tension was perhaps a shade increased. I left strict orders that if he complained at all of pain I was to be summoned at once. That was about mid-day. Next morning, between seven and eight, I received a message that my patient was suffering from acute pain, and had been for about four hours. On reaching the house, I found what I had quite expected. The tension was + 2, and the ciliary injection was very great. The lad had all the symptoms of an acute glaucoma, even to the vomiting. Contrary to the then received opinion that an inflamed eye should never be

touched, I at once drew off the lens by a linear incision made with a keratome. From that moment the pain entirely subsided, the patient made an excellent recovery, and with glasses the vision was ultimately $\frac{24}{44}$.

Wounds of the sclerotic may involve also the choroid or retina. Even when these structures have been injured, in most cases an attempt may be made to save the eyeball, and thus avoid the necessity of an artificial eye. Without doubt, the natural eye, though sightless, has a better appearance than an artificial one. In such cases rapid union is a matter of the first importance, and the principles applicable to wounds of the cornea apply here also. The essential condition is thorough coaptation of the edges of the wound. As a rule, in an extensive wound of the sclera, it is well to bring the edges of the wound firmly together by a few points of catgut suture. Fortunately, in such injuries the conjunctiva comes to our rescue. Generally speaking, it can be very easily stitched over the scleral wound, and thus very effectually protect it from sepsis.

It is not easy in a short communication to discuss injuries which are complicated by the introduction of foreign bodies. These may be lodged in the cornea, in the anterior chamber, in the lens, in the vitreous body, or, indeed, in any part of the eye. The prognosis largely depends on the situation and condition of the foreign body. Apart from the question of sepsis, the prognosis depends on the possibility of withdrawing the foreign body from the eye and on the amount of injury done both by its entrance and removal.

It is, perhaps, somewhat rash to say anything of sympathetic ophthalmia, as our knowledge of its pathology is, as yet, somewhat nebulous. The description of the malady we owe to the genius of Mackenzie, who favored the opinion that it partook of the nature of a neurosis. He it was who first said that it was an affection associated with a wound in the other eye. No very essential change was brought about in our view of the malady till Snellen, about the year 1881, suggested that it was probably a septic affection. The subject was made matter of experimental investigation by Dentchman and others, and, as a result, the belief gradually gains ground that sepsis has at least something to do with it. There seems little, if any, doubt that sympathetic ophthalmia is a true inflammatory affection spreading along the optic nerve, through the chiasma, and into the other eye. It is needless to enter into a long synopsis of

opinion expressed by many eminent authorities in an address of this kind.   Those who are curious about such matters will find full justice done to the subject in Professor Schimer's excellent paper (*Graefe's Archiv*, xxxviii. pt. 4).

But we may ask what evidence lies to our hand from the clinical aspect.   I think a good deal of valuable clinical evidence is available.   And first of all the clinical observations of Mackenzie led him to form the opinion that the disease invariably followed an injury.   His exact words are, "It is the result, in the one eye, of a previous mechanical injury, which has already greatly impaired or destroyed the other."   It is the experience of every one that almost all, if not all, cases are caused by injury.   But have we ever sympathetic ophthalmia without injury?   Personally, I have never seen it.   No doubt it may not be set up till many years after the injury. Such cases, however, are rare.   In a vast preponderance of cases, the disease begins within a few weeks after the injury.

Whenever we have a self-propagating inflammation there we have, I think, evidence of septic action.   It may, in certain cases, be very difficult to find out how the germs have found their way into a structure.   But when an inflammation is found to be self-propagating, there is no evidence to show that it is anything else but of septic origin.   It may be that the germs have not been recognized, or that we as yet fail fully to understand their mode of action, yet all we know of such inflammations points to their being caused by germs.   Few will at present deny that the vaccine pustule is due to germs, but they have not yet been isolated.

Another important clinical point is, that with anything like reasonable care sympathetic ophthalmia never now occurs after cataract extraction.   Even some of the text-books have ceased to discuss such an eventuality.   Occasionally on proposing a cataract extraction, one is still asked by the patient, "Will operation on this eye injure the other one?"   Not so very long ago such misadventures did occur, and patients knew it.   To-day the thing is impossible, such an accident never occurring when ordinary care is taken. This is an historical fact of the utmost importance.   We can now operate without the slightest risk of injuring the other eye.   From this we derive a valuable lesson in the prophylaxis of sympathetic ophthalmia.   If we can prevent this disease ensuing from an operation wound, is it unreasonable to hope that in a very large number

of accidental wounds we may be able to do the same?   To this ques-
tion we answer unhesitatingly that the prevention is quite possible.
Let the surgeon get hold of the wounded eye before it has become
affected with septic inflammation; then, provided there is no foreign
body in the eye, he can leave the eye in the patient's head with con-
fidence, provided he gets early union and that no part of the tract
is caught in the cicatrix.

It is wrong to make hasty conclusions from vague generaliza-
tions, and, as every one knows who has attempted it, it is almost im-
possible, with scientific accuracy, to draw any absolute conclusion
as to the value of treatment.   Still, I may be permitted to mention
what is a fact, that during the ten years that I have had patients
under my care in the Glasgow Eye Infirmary, only two have taken
sympathetic ophthalmia.   I have seen a large number of injuries
in that time, and have made many operation wounds, some of them
not aseptic, yet only two patients have taken sympathetic ophthalmia
who had not already contracted the disease when they came to the
hospital.

It thus seems to me that the best preventive is the proper treat-
ment of the original wound.

The administration of internal remedies has little, if any, effect
in the prevention of sympathetic ophthalmia.   A most careful sta-
tistical inquiry, conducted in London about fifteen years ago, proved
beyond dispute that the routine administration of calomel and opium
in injury had no effect whatever in preventing sympathetic oph-
thalmia; yet, notwithstanding, many surgeons continued for years
after to use it.   It is very easy to write prescriptions, and to dignify
the ingredients with the title of constitutional remedies; yet, per-
sonally, I have never seen any occasion to believe that they are of
more than doubtful efficacy.

As to what the future has in store, speculation would be idle.
Yet it is not beyond the possible that in time to come a serum may
play a not unimportant part in the treatment of sympathetic oph-
thalmitis.

CLINICAL OBSERVATIONS UPON SENILE HEART, WITH REMARKS ON TREATMENT.

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GENTLEMEN,—The term "senile heart," as employed in this article, refers only to that retrograde change of the myocardium which is consequent upon those diminished metabolic processes invariably attendant upon age; that is, the normal lessening of inherent cell activity which takes place because the life unit has neared its "threescore years and ten." The totality of phenomena indicative of such, by reason of the complexity of relationship characterizing the organology of the human economy, fortunately represents a process which is operative under two widely different conditions, and may therefore be symptomatic of a general or systemic age, and a cardiac or limited senility constituting a special but prematurely old condition. The former is entire, while the latter is local and is the consequence of influences active throughout life and due to circumstance and environment. This develops a condition in which the individual is younger vitally than is the heart, and therefore doomed to premature impairment of function as well as death. One is an expression of a properly related exhaustion of general cellular life, and the other of a similar process limited, however, to the organ considered. The "equilibrium of the metabolism," or fulfilment of those functions by which cell life, in its entirety, elaborates from pabulum the principles necessary to being, and thereby equalizes supply and demand, is possible only when the unit of vitality has not run its course; and when functionating fails by reason of diminution of the vis vitæ, senility, in the true sense, exists, and structure so characterized is incapable of rejuvenation. The heart thus presenting, little if anything can be

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accomplished by any system of treatment. On the other hand, local conditions, in a sense external to the cell, may be operative, and result in practically the same ultimate end, but the process is one of *starvation*, and not a consequence of exhaustion of the vital force, which prevents a cell from appropriating nutriment notwithstanding an adequate supply; therefore, if under such surroundings functions essential to corporeal life fail, and it is practicable to restore the supply of necessary nutriment, metabolism will be re-established, and with it all functions dependent thereon. Bearing in mind, then, the restricted sense in which the term "senile heart" is used, a brief review of the minute structure of the organ will be made, and allusions also to some physiological factors intimately related to its nutrition. The myocardial cells are, in addition to their striation, peculiar in being mononucleated and possessing serrated ends. These anastomose with the corresponding processes of adjacent cells, and form a variety of reticulum. There is no distinct sarcolemma as in voluntary muscle. Variously distributed between the cells is an exceedingly attenuated white fibrous connective tissue, which serves as a support for the net-work of lymph and blood capillaries. This structure is demonstrated to be continuous with the endocardium and pericardium. The myocardial cells are agglutinated with an inter-cellular substance comparable to cement. A prominent character-istic of these cells is the absence of a direct supply of arterial blood; indeed, the pabulum upon which the cells subsist, and by which their life is maintained, is derived by imbibition and metabolism from an intercellular fluid, just as are those of cartilage and the cornea.

The blood-supply of the heart is obtained only from the coronary arteries, which, while anastomotic in their primary divisions, are ulti-mately terminal and incapable of having a collateral circulation established. The importance of remembering this feature will ap-pear farther on. At this juncture it should be stated that the com-pleteness in every detail of a cardiac cycle, and its resultant output of blood into the aorta, depends almost exclusively upon the volume of blood, following each pulsation, which circulates through the cor-onary system. The bearing of this upon cardiac nutrition is self-evident: it means that the normal functional activity of each cell is dependent thereon, for while these anatomical elements, as has just been stated, do not receive a supply of arterial blood, the several factors operative in maintaining the proper circulation of the lymph

and intracapillary fluids—in a word, the supply of pabulum and consequent nutrition—are the result. Physiological investigation upon animals has definitely proved that sudden obliteration of one coronary artery is followed by pronounced irregularity of ventricular contraction, and while occasionally total arrest may temporarily occur, there is, as a rule, localized imperfect but frequent efforts at contraction, a loss of coördination. This effect is frequently noticeable in limited areas, and demonstrates the terminal features characterizing the ultimate distribution of these vessels. Actual observation also demonstrates *that during systole there is a progressively diminishing intraventricular pressure and a corresponding increase during diastole,* and when this alteration of circulatory equilibrium occurs, there is irregularity of heart-action, both as to time and force.

Here we artificially establish a condition which is practically operative in senile heart. The *force* of the beat is due to the normality of coronary circulation, while the rate depends upon other factors; hence, if this special circuit is abnormal, there is a *proportional diminution of cardiac power* and a *subtraction from the nutritive phenomena.* What determines normal coronary circulation? The orifices of these vessels are so situated that when the aortic valves close, immediately after the termination of ventricular systole, the pressure of the column of blood, which is augmented by the elasticity of this vessel, completely fills them. The now emptied and relaxed cardiac walls are especially easily resupplied with arterial blood, and the conditions upon which the vital phenomena depend are established. The aorta then is the great factor operative in determining coronary function, and its minute structure requires examination. It differs from the remainder of the arterial system in not possessing an internal elastic lamina; its intima is composed of endothelial cells immediately apposed to a layer of white fibrous connective tissue, through which is interspersed elastic fibres; this subendothelial layer is relatively largely developed. The media is characterized by the preponderance of elastic plates and the relatively small proportion of muscular structure. It is also interspersed with the white fibrous connective tissue. The adventitia is very elastic and supplied with the vasa vasorum, and is the seat of termination of the vaso-motor nerve-filaments. The deeper structures of this great artery are, like the heart, nourished by an intercellular fluid. The

white fibrous connective tissue is a scaffold for the plexuses of capillaries, and serves a mechanical rather than a vital function.

Thus the aorta may be considered to be an organ whose chief function is that of elasticity, and upon the normality of this are factors underlying cardiac nutrition. Inherent properties peculiar to the nature of the component elements of this artery render it prone to that diminution of function which is the accompaniment of age, and the significance, so to speak, of this relatively curtailed longevity, and the consequent predisposition to earlier nutritional variations than obtains in other tissues of the body, is commonly seen at autopsies, where organic changes are encountered which are disproportionately advanced. There are, of course, other factors, chiefly strain and all that is embodied therein, influencing compensatory nutritive processes relational to the intensity and duration of its action, which play a rôle in affecting changes akin to those of age, but of these it is not the purpose of this paper to treat. As to the etiology of senile heart, the above facts render it plain that it is a retrograde change affecting the myocardium and directly resulting from diminution of the supply of pabulum, and while, for emphasis, that due to the aorta is dwelt upon, the fact must not be overlooked that reduction of arterial pressure and the consequent lessening of coronary arterial function can depend upon varying degrees of obstruction to these channels resulting from local pathological processes, and also peripheral defects of the vaso-motor system; the principle, however, is the same. In the majority of studies personally made, the aortic lesions were the more conspicuous.

Pathology.—The lesion is essentially degenerative in type, and is characteristic of advanced and long operative cloudy swelling. Macroscopically, according to the degree of metamorphosis, the organ is altered in consistency, and is less resistant to force; the alterations may be especially noticeable in limited areas. There may be alteration in size, sometimes there is diminution, and again, seemingly, enlargement. Microscopically, the striations are obliterated more or less, and the nucleus enlarged and altered in contour, presenting the characteristic appearances, not of reparative effort or karyokinesis, but of fragmentation. Consequently, it has frequently broken down into two or more portions of irregular size, and pigment may be deposited near the extremities of the cells. Single cells, as well as groups, have lost the intercellular cement, and separation one from

the other occasionally takes place. At times there is true fatty degeneration as indicated by globules of oil.

Any or all of these retrograde changes are more or less present in varying degrees in a given specimen, and are practically but advanced stages of one process. That diseases and acute disorders of an inflammatory type do produce similar alterations is not to be denied, but this is a matter of a totally different nature. The lesion is frequently circumscribed, and demonstrates the influence upon nutrition, as determined by the terminal character of the arterial blood supply. In fatal cases of purely senile heart the condition of the aorta was especially noted, and from the profound changes there observed attention was directed to it as a probable primary cause. Study of this vessel prominently brought to mind its peculiar histology and the physical property, elasticity, and from these factors are formulated the theory upon which the treatment was instituted. The alterations occurring in the heart itself were regarded as largely secondary to those of the aorta. Before discussing the treatment and prognosis, a brief description of the most prominent symptoms will be sketched. Preternaturally frequent pulse and diminution of resistance constitute particularly the early phenomena. Coincident therewith is variation of the force and rate. Early in the disease these manifest themselves intermittently, and are usually noticeable after slight exertion. Not infrequently during an examination these variations will occur, and can be easily perceived. Shortness of breath is associated as a symptom under conditions that formerly were not so characterized. The duration of these for some months, and the gradual augmentation of the phenomena, are apt to be complicated with the development of a sharp, dry, spasmodic cough, which after a time is accompanied by the formation of a small viscid mucoid sputum, quite difficult of expectoration, and greatly aggravating the troublesome symptom. The venous system now begins to manifest over-fulness, and the superficial veins become prominent, tortuous, and distended. The organs partake of this passive hyperæmia and imperfectly perform their functions. Especially is this noticeable in the digestive system, and senile dyspepsia supervenes and presents the usual symptoms. Renal function is characterized by hypersecretion and albuminuria. This latter at times is very pronounced, and is no small factor in the enervating process. Alterations in the walls of the venules and capillaries are now discoverable, and the

structures which receive their nourishment, and have the detritus of functional activity removed by means of these, themselves become the seat of degenerative action. Thus normality of function is affected, and in organs of higher type, such as the cerebrum and cord, there are evidences of failure long before organic change has taken place. Forgetfulness and a slight but recognizable difficulty of locomotion is not unusual, and the sphincter reflexes may be sluggish. Still later, disturbances of intellection occur, and are not infrequently so marked as to lead to the conclusion that structural change has occurred instead of a simple impairment of nutrition. It may be here remarked that not rarely these phenomena disappear under the treatment to be recommended, and thus prove the functional character of the difficulty. Symptoms premonitory of apoplexy, such as numbness of the extremities, and, indeed, true capillary effusions, are encountered. Ruptures of the retinal vessels and nutritional changes of the crystalline lens occur. Vaso-motor tone now is lost, and cyanosis and œdema supervene. Not infrequently disturbances of cutaneous nutrition manifest themselves in the lower extremity by the development of eczema. Thus the process steadily advances, this or that special organ undergoes retrogression, and life is finally destroyed.

Treatment.—As the condition is the direct result of interference with cardiac nutrition, and this in turn the consequence of diminished arterial tension, the principle underlying treatment is restoration of circulatory equilibrium, and, as the symptoms manifest themselves early in the process, that remedy should be exhibited which is known to possess the power to accomplish this. As it can be effected before the interference has been operative sufficiently long to result in organic change, the prompt institution of corrective measures will stop the process, re-establish metabolism, and render the victim, in so far as the circulatory system is concerned, as young, so to speak, as is his general vital unit.

As the aorta has already undergone changes which have *permanently* impaired its elasticity, it is necessary to maintain the treatment more or less constantly, as this cause is always operative. The diminution of recoil of the column of blood in the aorta consequent upon this loss of elasticity can, fortunately, be compensated for by supplying a proportionally increased force; this is accomplished by increasing the power of the ventricular contraction, and

the remedy must be administered in doses sufficiently large to thoroughly counterbalance the defect.

The remedy to be employed is *digitaline German* of *Merck.* Comparative study of this with the derivatives of digitalis has demonstrated it, beyond all question, to be an alkaloidal principle possessing a constancy of therapeutic power, and unvarying in its effects. Its dose ranges from one-tenth of a grain as the minimum to one-half as the maximum. These quantities should be administered from three to six times daily as the indications demand. Its especial action is to prolong diastole, whereby much rest is secured to the heart, and to greatly augment the force of the systole. It also exerts a direct action upon the vaso-motor centre, as well as the arterioles, and by this it compensates for the loss of the physical or mechanical factors, contributing to the maintenance of arterial tension, by calling into play the vital phenomena by which the vaso-motor system achieves its very important function. Thus *both mechanically and vitally* does this remedy meet the requirements, and its continued exhibition, properly regulated, ultimately results in a restoration to normality, which, under the usual circumstances that rule, are unlooked for.

Auxiliary measures are sometimes used with decided advantage. The exhibition of alcohol in the form of whiskey or brandy in some few cases, seems to add very materially to the results attained. Strychnia is also of service, and may be employed when, after restoration of arterial equilibrium, there seems to be a need for general tonic effects. The diet should have eliminated from it the excess of nitrogenous elements, and attention should be given to hygiene in its broad sense.

Prognosis.—If the condition is seen in its incipiency, and the treatment indicated skilfully applied, an immediate check of the march of premature senility is secured, and phenomena which usually present themselves, as a consequence of this, in from one to two years, are invariably, other things being equal, delayed for several. If the conditions are pronounced, very great benefit can be secured, and no small degree of disability is dissipated and a life of suffering converted into one of comfort. Therefore, where premature death threatens, we can with assurance promise a prolongation of life equal to that of the vital unit possessed by the individual sufferer.

THE TREATMENT OF CARCINOMA OF THE STOMACH.

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GENTLEMEN,—The treatment of carcinoma of the stomach is a subject of absorbing interest. The beginning of the disease is so insidious, its progress often so deceptive, and its termination usually so sudden that much time and thought have been given by the medical profession to discover means of diagnosis and cure. Studies in the line of diagnosis have been crowned with greater success than those directed to the treatment of this malady; yet much has been accomplished in the therapeutic field, and we may hope for still more brilliant results, since so eminent an authority as Virchow believes it possible that nature may be able to produce spontaneous cures. If nature has means of producing a cure of cancers under any circumstances, man will yet detect agencies or remedies which can assist nature in her efforts to eradicate these morbid growths.

What rational method can be adopted in the search for such a remedy? It matters not what view of the pathogenesis of cancer we take, we know that its cure must be accomplished by extermination, —(a) extirpation, immediate and total; or (b) by such a reinforcement of the natural reparative forces as will aid in the extermination of these strange proliferating cells. If any remedy can be found which will strengthen the ultimate cells of the body in their struggle with these destructive processes, without doubt something will be done towards producing a cure for cancer. We may hope, in fact we may confidently expect, that the time is not far distant when the brilliant achievements of physiological chemistry and cellular therapeutics will be crowned by a discovery of such a remedy as is needed

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in these cases of disease of the ultimate vital elements of the body. Reports have already been made of agents discovered along this line, and to some of them we will refer later.

It may be said that at the present time our knowledge of this subject makes it necessary for us to endeavor to meet the following three indications: 1. The relief of urgent symptoms. 2. The relief of dyspeptic symptoms. 3. Removal of the disease. The object under the first two indications is palliative; under the third, curative.

1. The urgent symptoms are (a) pain, (b) vomiting, (c) hemorrhage, (d) perforation, (e) constipation, (f) diarrhœa. Pain, vomiting, hemorrhage, and perforation are often so very urgent that an attempt to relieve the patient should be made before search is commenced for the cause of the symptom.

(a) To relieve pain will frequently require the use of morphine and atropine subcutaneously in doses of one-quarter of a grain of the former and one-one-hundred-and-fiftieth of a grain of the latter. Sometimes this dose may be combined with hydrobromate of hyoscine (one-one-hundredth of a grain) with great success. The morphine and atropine quiet the pain and the hyoscine allays the nervous symptoms. I have seen this combination produce excellent results in many instances. Caffeine is sometimes valuable, especially if antifebrin is used, and may be given in one-half- to two-grain doses per os every two or three hours to sustain the heart and quiet restlessness. Hydrochlorate of cocaine or fluid extract of erythroxylon may be given for a local anodyne effect. The cocaine may be given by the mouth in doses of one-eighth to one grain in pill and the erythroxylon in half-drachm doses every three, four, or six hours in severe cases. Antifebrin is recommended by Demiéville. Hoffmann's anodyne has been recommended, and chlorodine will often give relief. Gelsemium is an excellent remedy for continuous use, and has valuable anodyne and nervine properties. It may be given in the form of tincture in five- to eight-minim doses four to six times a day. Riess claims to have secured excellent results from the prolonged use of condurango. Sometimes lavage with an alkaline solution has given relief. Great caution is required, however, if lavage is attempted in such cases. Usually it is better not to attempt it, especially late in the history of the case. The momentary use of chloroform or ether has been made for excruciating pain to quiet the patient until other remedies have had time to take effect. Its ad-

ministration requires caution. The use of atropine and morphine, or some other form of opium, with belladonna will answer the requirements in most cases. The likelihood or possibility of inducing the opium habit may be disregarded, as temporary comfort is all you can promise the patient.

(b) Vomiting is frequently distressing. In the absence of remedies included in the materia medica I have often found relief in the use of a weak lye made by putting two tablespoonfuls of clean wood-ashes into a pint of water and giving a teaspoonful of the lye every ten, fifteen, or thirty minutes as needed. I use the following mixture in most cases: Bismuth subnitrate, one drachm; oxalate of cerium, one-half drachm, in half a glass of water. Give a teaspoonful every fifteen or thirty minutes if necessary; but I find it is seldom required more frequently than once an hour. The employment of the stomach-tube is sometimes very serviceable in these cases if used with caution. The cold douche or lavage with hot water or alkaline or acidulated water will meet this indication in different cases. Electricity—one pole intraventral—frequently gives temporary relief. The electric cautery applied to the epigastrium has been used with a degree of success.

(c) Hemorrhage sometimes is alarming and requires active measures. Rest and quiet in bed and the use of ice internally and an ice-bag applied to the epigastrium may be all that is needed. Not unfrequently, however, on account of the profuseness or persistency of the bleeding, it may be advisable to resort to the hypodermic use of ergot or ergotin. In emergencies I do not hesitate to use thus fifteen minims or more of the fluid extract if I do not have a more suitable preparation at hand.

(d) Perforation of the stomach walls is a fatal accident in most if not in all cases. Even if death could be delayed by adhesions to adjacent tissues, the stage of the disease in which this misfortune occurs is so near the end that stimulation and, if necessary, anodynes to control pain are about all the measures usually required.

(e) Constipation is not so serious as some of the symptoms already mentioned, but may exist throughout the entire course of the disease, and it is often necessary to give immediate relief. Under such circumstances, if an enema of glycerin, warm water or warm soapsuds, salt water, etc., does not cause an evacuation of the bowels, usually it will be found that an enema of a teacupful of infusion of senna-

leaves containing two tablespoonfuls of Epsom salts will be entirely satisfactory. To overcome the tendency to constipation early in the case the persistent use of cascara sagrada or compound liquorice powder will generally be found sufficient.

(f) Diarrhœa frequently occurs in gastric carcinoma, and requires attention. If due to irritating fluids or materials passing into the intestine from the stomach, lavage in suitable cases (that is, in cases where there is no special contra-indication for the use of the tube) may be sufficient to check the diarrhœa. In general the removal of the cause will check the discharge. If the cause cannot be determined, the use of bismuth subnitrate and oxalate of cerium, with opium and astringents, especially acetate of lead, may suffice to control this complication. The administration of antiseptics is often all that is needed.

2. The relief of dyspeptic symptoms requires careful regulation of the diet and such assistance to digestion as will in part supply the deficiencies of the gastric secretions in this disease. When it is remembered that hydrochloric acid and pepsin are generally absent or diminished in quantity in carcinoma of the stomach, it will be understood why we advise that proteids should be given very sparingly or predigested. In the early stages of the disease, and when the conditions are not known and this suggestion is not remembered, nature often comes to the patient's relief by causing a loathing of meat and sometimes of eggs. If these foods are administered without the precaution of predigestion, putrefaction occurs and the gas formed may cause painful distention or annoying eructations. The use of alkalies and antiseptics will be required as in other similar cases. Nausea and vomiting may occur, and must be treated with bismuth, ice, and alkalies.

The failure to digest proteids and their consequent putrefactive decomposition interferes with the proper digestion of other kinds of food. This interference with the digestion of carbohydrates sets up fermentation and the production of lactic and other organic acids. The fact also that stricture of the pylorus often exists, retaining food a long time in the stomach, will explain another cause of fermentation of farinaceous foods. Hence we curtail farinaceous diet. If dilatation exists, the food should not be bulky and liquids should be limited. Beneke and others, believing that the cancerous growth will thereby be checked, diminish or exclude albuminous or nitro-

genous food and limit such vegetable foods as furnish considerable quantities of phosphates. It must be remembered that a patient may tire of a too limited diet. Extremes must be avoided. I have found a mixed but limited diet to serve the best purpose. Hydrochloric acid, pepsin, and papoid may be administered with proteid food when it is not convenient to predigest it. Milk may be given in many cases, but on account of the deficiency of rennet in the stomach it ought to be predigested. Oppolzer makes the statement that patients with gastric cancer vomit less if they take all food cold.

Lavage is frequently necessary to remove refuse material, catarrhal products, and other débris before the stomach is in a proper condition for the reception of food. Especially is this needed if dilatation is present. In the early stages undoubtedly the secretions may be increased by treatment. This may be accomplished by giving the vegetable stomachics and mineral acids. The aromatic sulphuric acid is frequently very valuable. Condurango has been recommended by various authors, and may be used as routine treatment. Lately I have received good results in the beginning of the disease from the use of pilocarpine and electricity,—negative pole intraventral. Both these agents increase the gastric secretions.

3. Lastly we consider the curative phase of the treatment. It would be unprofitable to review the history of this subject, and I shall give only the principal remedies used to-day.

Virchow approves *chian turpentine*, recommended by John Clay, of London. It is possible that this remedy produces a tendency to degeneration of cells, and, if so, may attack morbid cells first. Arsenic is a standard remedy in cancer. It is possible that this agent tends to cause a degeneration of the pathological cells and to stimulate the connective tissue about them to a more vigorous growth. If this obtains, the result would be beneficial and the cancer cells would undergo atrophy. Brissoud thinks two cases in his experience were benefited by *chlorate of sodium*, but the remedy which has the greatest reputation at this time is *condurango*. Orszewsky and Erickson and others have reported successful cases. Riess has published many cases, in some of which the tumor had disappeared, and in others sensibly diminished. It has been suggested that this remedy stimulates the connective tissue to more vigorous growth; that this encroaches upon the cellular elements, and a degenerative atrophy results. *Pilocarpine* has been suggested in the belief that it

exercises an alterative effect upon the white blood-corpuscles. *Protonuclein* has recently been brought to the notice of the profession as a remedy which is said to have a powerful nutritive and alterative effect upon the elementary tissues and cellular bodies. I have seen one case, where all other remedies seemed to fail, in which the administration of this remedy in three-grain doses four times a day for two months relieved the vomiting, pain, and prostration. The case is too recent to determine whether the relief from the action of the remedy is permanent.

In the light of our present knowledge one may resort to any or all of the remedies named, but he should not venture a favorable prognosis, as it must be admitted that few physicians believe a specific has yet been discovered for this disease.

Surgical means have been successful in a few instances, but in the nature of the case the great majority of these patients cannot be treated by surgical interference.

HÆMOPTYSIS AND ITS TREATMENT.

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LECTURE III.

RHEUMATIC HÆMOPTYSIS.

GENTLEMEN,—This is a form of bleeding from the lungs which I believe happens more frequently than most of us are aware of. At least, this has been my own experience. In my earlier practice I had the feeling that if a case of hæmoptysis refused to yield to the administration of rest, cold externally and by the mouth, opium, ergot, gallic and tannic acids, acetate of lead, hamamelis, geranium, and turpentine, all had been done that was possible, and the consequences were left to take care of themselves. A retrospect at the present time teaches me that I might have prevented a fatal issue, in at least some cases, had I known and fully understood the widespread influence of what we call the rheumatic diathesis in bringing about this condition. Not only is this true of cases of hæmoptysis which are of a purely recognized rheumatic origin, but it is also good in many others in which there is not a trace of a personal predisposition to rheumatism, and in which the latter diathesis may become active some time after the cessation of the hæmoptysis, as I shall show by a typical case of the kind.

My acquaintance with this phase of hæmoptysis was made several years ago, and in no other than in an accidental way. I was at that time called to a case of blood-spitting which for two days resisted all active treatment with the usually recommended remedies. At the end of about forty-eight hours the patient began to show signs of articular rheumatism in his arms. The former treatment was now abandoned and the salicylates substituted, and the hæmoptysis, as well as the rheumatic pain, ceased almost immediately, and neither

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has returned up to the present time. After the happy and favorable termination of the affection in this case I began to look for a record of similar experiences by other medical men, but, so far as I could learn, all the text-books were silent on the subject, and no reference was made anywhere to the dominant influence of the rheumatic diathesis in the production of hæmoptysis, except the invaluable and practical work of Dr. Haig on "Uric Acid in the Causation of Disease" (p. 179).

Quite recently, in looking up the literature of this subject, I came across an article on "Arthritic Hæmoptysis," by Sir Andrew Clark, which was published in the *Medical and Surgical Reporter*,[1] November 30, 1889, p. 606, and, on account of the scarcity of similarly recorded experiences, I take the liberty of making the following quotations from it. Sir Andrew said, "It is not my intention upon this occasion to enter into any systematic account of this variety of pulmonary hemorrhage, this arthritic hæmoptysis, as I have ventured to call it. But as the cases related have led me to discontinue the ordinary method of treatment by astringents, and to try another method which seems to be more rational, and hitherto at least has proved more successful, I propose to illustrate two other illustrative cases seen in consultation with other practitioners. Some seven years ago, Sir William Jenner, Dr. Wilson Fox, and I were summoned together to consult about a lady suffering from an incoercible hæmoptysis. She was over sixty years of age, very stout, very rheumatic, and always ailing. She had nodular finger-joints, frequently recurring bronchial asthma, and occasional outbreaks of either eczema or of urticaria. Ten days before our visit, when suffering from an ordinary catarrh without accompanying fever, the patient began to cough up blood, and had continued to do so in small quantities at intervals of three or four hours since. The patient had a somewhat large heart, but there was no murmur, and no evidence of systemic arterial disease. Within the previous two days the pulse had become quick and frequent, and the temperature had risen to close upon 100° F. In the lungs there were signs of a generalized bronchial catarrh, of emphysema, and of basic congestion. The patient complained of frequent cough, of great oppression of the chest, and of growing difficulty in expectorating. She had, furthermore,

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[1] Copied from London Lancet, October 26, 1889.

a loaded tongue, thirst, loss of appetite, a swollen liver, and all the signs of a gastro-enteric catarrh. She had been carefully treated by absolute rest, fluid food, ice to the chest, and in succession by lead, gallic acid, and hypodermic injection of ergotin. After full discussion, it was determined that another method of treatment should be tried. The patient was ordered to have a light and rather dry diet, to be sparing in the use of liquids, to discontinue the ice, to have a calomel pill at night, followed by a saline cathartic on the succeeding morning, and to take an alkaline mixture with ammonia between meals twice a day. Within thirty-six hours the bleeding ceased and the patient made a speedy and complete recovery. About a year and a half ago the patient consulted me at my house for subacute rheumatic arthritis. She told me that since she saw me first she had had one attack of bleeding, and that it was quickly cured by calomel and salines.

"About six years ago I was summoned to meet Mr. MacLaren in consultation about the case of a solicitor who had been suffering from an obstinately recurring hæmoptysis of small amount. The patient was over sixty years of age, had always been delicate, and often suffered from incomplete attacks of what was considered to be rheumatic gout. He had rimmed finger-joints, patches of dry eczema, and occasional nervous headaches. A few weeks before our consultation he had contracted a feverish bronchial catarrh, and was confined to the house. After a fortnight's cold he began to have some oppression of the chest and to be short-breathed. This was followed by a small hæmoptysis which gave relief, but the hæmoptysis recurred, and at our consultation there was no sign of its cessation. The patient had no fever and only a slight hurry of circulation. There was a general bronchial catarrh, the foreparts of the lung were emphysematous, and there was some basic congestion, greater on the right side than on the left. The tongue was furred. There was anorexia, with some thirst. The bowels were inadequately relieved, and the urine was pale and of low density, but free from albumen. The patient was directed to rest and keep warm, to live upon a light, semisolid diet, to be sparing in the use of liquids, to be freely counterirritated over the chest, to have a succession of small doses of calomel at bedtime, supplemented by saline aperients in the morning, and to take between meals, twice or thrice in the day, a mixture containing iodide of potassium, bicarbonate of potassium,

and ammonia. This treatment was not particularly agreeable to the patient, who had medical views of his own; nevertheless, it was adopted, and appeared so far successful that within four days of its adoption the hemorrhage had ceased. I heard of this patient from a relative some months ago, and I was told, although he led a too sedentary life, he was well and at work.

"Many additional illustrations of this variety of hæmoptysis could be given, but as in each case there is a close resemblance to every other, and as in all cases the interpretation of the pathological conditions accompanying the hemorrhage and the treatment employed for its relief were substantially the same, I content myself with having brought to the notice of the society this curious form of pulmonary hemorrhage, and believe that a critical discussion of the subject will lead to broader and juster views concerning it. I conclude with a statement of the following propositions, which I have framed out of the results of my own inquiries.

"(1) That there occurs in elderly persons, free from ordinary diseases of the heart and lungs, a form of hæmoptysis arising out of minute structural alterations in the terminal blood-vessels of the lung.

"(2) That these vascular alterations occur in persons of the arthritic diathesis, resemble the vascular alterations found in osteo-arthritic articulations, and are of themselves of an arthritic nature.

"(3) That, although sometimes leading to a fatal issue, this variety of hæmoptysis usually subsides without the supervention of any coarse anatomical lesion of either the heart or the lungs.

"(4) That when present this variety of hemorrhage is aggravated or maintained by the frequent administration of large doses of strong astringents, and by an unrestricted indulgence in liquids to allay the thirst which the astringents create.

"(5) That the treatment which appears at present to be most successful in this variety of hæmoptysis consists in diet and quiet, in the unrestricted use of liquids, and the stilling of cough, in calomel and salines, in the use of alkalies with iodide of potassium, and in frequently renewed counterirritation."

My own experience with this form of bleeding is similar to that of Sir Andrew Clark, although it varies in some important particulars. From this I am led to believe that it is not confined to elderly people, nor to those who show any active arthritic manifestations

either before or at the time the bleeding occurs. Some of the most striking examples of what I call rheumatic hæmoptysis that I have witnessed have taken place in the young between eighteen and thirty years of age. Of this the case referred to in the early part of this lecture is a good illustration, and in another case, which I shall directly relate, the first joint trouble he ever had did not develop for nearly a year and a half after the hæmoptysis, although there can be no doubt that the rheumatic diathesis exerted a powerful latent influence in the production of the bleeding. Nor was there in this case any hæmoptysis during the rheumatic manifestation, but in the course of a month and a half subsequently, and after every active rheumatic symptom had disappeared, he had another slight attack of bleeding which yielded promptly to treatment.

I furthermore believe that the rheumatic or arthritic diathesis is a frequent and often an unsuspected complication of many forms of chronic lung-disease. Especially is this true of pulmonary phthisis. How often is it that one sees well-marked constitutional cases of this kind, without much pulmonary lesion, and without any well-matured hæmoptysis, but which will periodically persist in expectorating rusty or red-streaked sputum. Many of such cases and perhaps all of them belong to this rheumatic type, as is shown by the fact that they yield to antirheumatic medication, and to nothing else. Asthma, especially when associated with hæmoptysis, belongs to the same class of diseases. It is also benefited by the same method of treatment. Pleurisy is oftener a rheumatic affection than it is not. The pleural membrane forms a closed sac, and is a homologous structure to the closed synovial sacs of the joints. In pleurisy the rheumatic toxin concentrates its activity on the closed sac of the chest instead of the synovial sacs, and you have a rheumatism of the pleura instead of having a rheumatism of the articulations, although the two may coexist. Hæmoptysis is also a not very infrequent complication of pleurisy, and both are amenable to the action of antirheumatic remedies.

CASE I.—The following is a history of the first case of frank rheumatic hæmoptysis that came under my observation. D., aged eighteen, with a marked heredity of pulmonary consumption and asthma on both sides of his family, began to expectorate blood a month before he consulted me. Just before I saw him he had profuse hæmoptysis, and when I arrived he was in bed and still spitting

blood. He appeared to be plethoric and in the best of health, but complained of a fulness and constriction in his chest, of an inability to take a full breath, and of a numb feeling in his hands and forearms, "as if they were asleep." I gave him morphine, ergot, hamamelis, geranium, and quinine. In spite of this treatment, he had several large hemorrhages during the following forty-eight hours, and the oppression of the chest and numbness in the hands and arms remained. On the evening of the third day he began to develop a slight but distinct pain in the finger-, wrist-, elbow-, and shoulder-joints, and the numbness in his forearms became a little more marked. The bleeding from the lungs continued. I now treated the rheumatism with the sodium salicylate, potassium acetate, and digitalis, and discontinued the other agents, without any idea that I would in the least influence the hæmoptysis. Much to my surprise, however, he improved promptly in every respect from that time on. The oppression in his chest, the numbness in his hands and arms, and the hæmoptysis were dissipated almost immediately. He continued the salicylate mixture awhile, and was afterwards placed on strychnine and the syrup of the hypophosphites, and up to the present time has not had a recurrence either of rheumatism or hæmoptysis, and is pursuing his former vocation again.

CASE II.—This is the case in which the rheumatic outbreak occurred about a year and a half after he had hæmoptysis. C., aged thirty-four, for more than a year before I saw him had a slight cough and expectoration, had been losing flesh, and had some pain in the right side of the chest. His appetite was poor, bowels regular, tongue very thickly furred, slept poorly, was tired constantly, had some dyspnœa, but never had rheumatism. His father died of rheumatism, but there was no lung-disease in the family. The day before I saw him he had a copious hemorrhage from the lungs, which continued in a modified form until his first visit. At this time his morning temperature was 99.8° F., pulse 86, respiration 28, weight one hundred and forty and three-quarters pounds, and his stature five feet ten inches. There were diminished respiratory movement, weakened respiratory sound, and impaired percussion resonance over the whole of right, and puerile breathing in left chest. I gave him sodium salicylate and quinine, and a combination of dilute nitro-hydrochloric acid, phosphoric acid, aromatic sulphuric acid, and tincture of the chloride of iron, of each five drops in sweetened

water. He made a prompt recovery, gaining sixteen pounds in two months. After this he went to work steadily for nearly eighteen months, when he had a severe attack of acute articular rheumatism, which affected the feet, ankles, knees, hips, and back. He was again placed on the salicylates, and made a speedy convalescence. He had no hæmoptysis until the rheumatism had disappeared, when this recurred in a light form.

CASE III.—This is a case in which there is no personal evidence of rheumatism, but the diathesis is rather marked in his mother and her family. L., aged eighteen, suffered from infiltration of right lung, loss of flesh, cough and expectoration, occasional blood-spitting, dyspnœa, chills and fever, and general lassitude. There was no lung-disease in the family. His mother is rheumatic, and one maternal aunt died of rheumatism and Bright's disease. About two weeks after I first saw him he was taken with one of the most violent attacks of hæmoptysis I ever witnessed, volumes of blood came from his mouth and nostrils, and he also vomited a large amount of blood which he had swallowed. Ice was applied to his chest and the salicylates were administered, and the blood-flow ceased; there has been no recurrence since, after a lapse of a year and a half, and during this time the boy has gained twenty-six pounds, and is in good health.

Many more interesting cases of this kind could be related here, but the above represent all the various types of rheumatic hæmoptysis so far as my observations extend. That is to say, persons without a family or personal history of rheumatism, but who have a marked family history of phthisis, develop rheumatism and hæmoptysis simultaneously; persons with a family history of rheumatism develop hæmoptysis and phthisis, but no well-marked characteristic manifestations of rheumatism; and persons with a family history of rheumatism develop hæmoptysis and rheumatism, but not at the same time.

Pathology.—Now, in regard to the pathology of rheumatic hæmoptysis, I believe that this is intimately dependent on the toxic action of uric acid. I am firmly convinced of the great utility and practical importance of the theory recently advanced by Dr. Alexander Haig, of London, England, which clearly shows that uric acid is vitally concerned in the causation and evolution of many chronic nervous disorders, such as migraine, epilepsy, mental depression, dia-

betes, gout, rheumatism, etc., and there is no question in my mind that the same agent despoils and disintegrates the vasomotor nerves and, indirectly, the walls of the pulmonary capillaries, and in this way brings about hæmoptysis. This opinion is at least inferentially corroborated by the post-mortem appearances of the following case[1] of arthritic hæmoptysis described by Sir Andrew Clark in the *Boston Medical and Surgical Journal*, April 10, 1890, p. 350.

"The patient, a man fifty to sixty years of age, who for many years had been subject to moderate, progressive osteo-arthritis, suffered for the last four or five winters from severe bronchial catarrh. At first there were signs of some pulmonary congestion at both bases behind, while the front of both lungs was somewhat emphysematous, but nothing was found suggesting tubercular disease. The heart and blood-vessels were sound. The patient at that time was not seriously ill, but two weeks later began to cough up small quantities of blood, and in spite of absolute rest, the strict regulation of supplies, the application of ice to the chest, and the liberal use of astringents, the bleeding continued, and he died in a week. The autopsy revealed no evidence of either tubercular disease, malignant growth, or any sort of coarse structural change which could account for the fatal hemorrhage. The bronchial mucous membrane almost everywhere was swollen and congested, violet in color, and coated with muco-purulent secretion. The anterior parts of both lungs were pale, dry, and emphysematous, and curious isolated patches of emphysema surrounded by hemorrhagic extravasations were noticed in the back and lower parts of both lungs, which were loaded with blood.

"The microscope showed the seat of the hemorrhage to be in the immediate neighborhood of the emphysematous patches, and that the minute vessels, chiefly the terminal arteries, were in these localities always diseased, the changes being similar to those found in the diseased articulations of the arthritic diathesis."

From this it will be observed that in all probability the rheumatic toxin brings about hæmoptysis in the same way as has been shown to be the case with the poisons of alcohol and syphilis in the previous lecture,—viz., by destroying the integrity of the pulmonary nerve-supply.

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[1] Abstracted from the British Medical Journal, October 26, 1889.

Symptoms.—Among the symptoms which distinguish rheumatic hæmoptysis from other forms of lung bleeding are: (1) Articular pain or stiffness in some of the joints; if these are absent there exist in all probability a family history of rheumatism or of phthisis,—most likely the former in connection with the latter. (2) Pain in one side of the chest, which may or may not be of pleuritic origin. (3) Aching or numbness in one or both forearms. This may be confined to the arm of the same side on which the chest-pain is located. (4) The bleeding is either copious or slight, and in the latter case the expectoration is protractedly discolored or streaked. (5) The cough and expectoration are comparatively light. (6) Dyspnœa, as a rule, does not exist in an aggravated form, although in some cases it is very pronounced. (7) Fever, as a rule, is low, or absent except at the beginning of the attack, when it may be very high. (8) In some cases there is pain in the region of one kidney which radiates towards the bladder, and which is accompanied by vesical and urethral irritation. (9) There is often a diminished amount of urinary secretion. (10) In some instances the condition is associated with appendicitis. (11) The disintegration in the pulmonary organs, as shown by the physical signs, is out of all proportion to the degree of constitutional exhaustion and depression.

Treatment.—The treatment of rheumatic hæmoptysis resolves itself in perfect rest and in the administration of medicines which antagonize the rheumatic tendency. The first means absolute quiet in bed for the patient, especially if the blood-spitting is rather copious, and to secure this the hypodermic administration of a quarter of a grain of morphine may be necessary as often as the case demands it. The second indication is fulfilled by giving sodium salicylate, cinchonidiæ salicylate, potassium carbonate, potassium acetate, ammonium muriate, lithium citrate, potassium iodide, calomel, colchicum, guaiacum, and alkaline bitter water, like Carlsbad, Marienbad, etc. A convenient formula, and one which I frequently use is the following:

℞ Sodæ salicylatis, ℨiiss;
Cinchonidiæ salicylatis, ℨii;
Potassæ acetatis, ℨi;
Aquæ gaultheriæ, q. s., f℥iv.   M.
Sig.—One teaspoonful every four hours.

There is one difficulty in giving the salicylates, and that is their tendency to derange the organs of digestion, particularly when given

in large doses. I found, however, that by combining them in small quantities as above with one or two alkalies this baneful influence is in a great measure avoided. Lithium, put up in the form of effervescent tablets and dissolved in a glassful of water, is a very convenient way of giving this alkali. When anæmia is present some form of iron is useful, and it has been my custom to prescribe the tincture of the chloride of iron with aromatic sulphuric, dilute nitrohydrochloric, and phosphoric acids, in equal parts, and give twenty, thirty, or thirty-five drops in half a glass of cold sweetened water after meals. The lithia tablets or mineral waters may be given during the meals. Quinine and strychnine are also indispensable. The diet must be of the most nutritious kind. The importance of the ice-bag locally applied to the chest is also of great utility in checking hæmoptysis. After the patient is well enough to be about, cold ablutions of the chest are valuable in accustoming and inuring the body to the effects of cold. Respiratory therapeutics is also useful after full convalescence has been established.

DIAGNOSIS AND TREATMENT OF HYPERTROPHIC NASAL CATARRH; THE CLIMATIC TREATMENT OF PHTHISIS PULMONALIS.

BY E. L. SHURLY, M.D.,

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HYPERTROPHIC NASAL CATARRH.

GENTLEMEN,—You have seen this morning three distinct types of so-called nasal catarrh, in all of which there was presented enlargement of the turbinated bodies which might be denominated hypertrophic. In the first class of cases the inferior turbinated body of each side was red and protruding into the nasal passage, almost, if not quite, to the septum, causing thereby almost complete stenosis of both nasal passages for a part of the time, and alternately on one side or the other for the remainder of the time. There was a profuse discharge of watery secretion, more or less sneezing, frontal headache or smarting pain, abnormal tone of the voice, dryness of the throat, more or less spitting of saliva and buccal mucus, and general mental and physical depression. These patients all complained of a feeling of debility, abnormal sensations of heat, restlessness, unsatisfactory sleep, capricious appetite, constipation, a bad taste, and showed coated tongues. One of them also suffers from occasional papular eruptions of the skin accompanied with annoying itching, which, when present, seems to her to afford relief from the nasal symptoms. You notice that the swollen mucous membrane is very red and quite soft to the touch with the probe; that directly following examination there is an increased flow of watery mucus and suffusion of the eyes with a desire to cough. You will also remember that all of these patients live in cottages and sleep near the ground; that one of them works in a damp tobacco factory; that two of them have

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very bad teeth; that another has a very dusty occupation; while still another suffers from facial neuralgia; also, that they all present symptoms of nervous disturbance.   We learn that they have been suffering from these maladies three weeks, six weeks, and three months, respectively.   Our examination fails to show true hypertrophy or hyperplasia of any of the mucous membranes about the nasal passages, naso-pharynx, or pharynx, or evidence of chronic disease of the sinuses; we find engorgement of the vessels only.   The tonsils are not hypertrophied, nor is there any serious deformity of the nasal septum.   We also fail to find that any of them suffers from idiosyncratic coryza (hay-fever), or from asthma.

In the next group of patients to which I call your attention we find also great swelling of the turbinated bodies, but no visible hyperæmia; these bodies are of a gray, sodden appearance, soft to the touch.   The tonsils are spongy and pale.   There are no deviations or spurs of the nasal septum, or special enlargement of the pharyngeal tonsil, nor evident ethmoidal disease.   The turbinated bodies are not sensitive to the touch with the probe, for sneezing, extra secretion, and lachrymation are not easily excited; the secretion is not watery, but thicker and not excessive, excepting at morning and night. These patients are anæmic, the females showing bloodless countenances and blanched buccal mucous membranes.   One of them gives a history of alcoholic dissipation, while evidences of bad hygienic surroundings and deprivations of the comforts of life are seen in all.   They feel weak and out of health, to use a common term.   The general condition of the nasal passages causes great discomfort, especially at night, and in a moderate degree alternates between the two sides.

In the third group of cases which form the subject of our study to-day you notice that the turbinated bodies are enlarged and very firm, semi-solid; that some are quite highly colored, and some are pinkish-gray or gray; and, as I said before, all present a solid feel to the touch of a probe.   You will also notice that in two of the cases there is marked deformity of the nasal septum, one having had the nose broken by a blow from an iron wrench when a small boy, while in each there are abnormalities, more or less marked, of the pharyngeal or palatal tonsil, with a so-called granular condition of the pharyngeal wall.   The secretion, too, in these cases, is thick and

tenacious, sticking as you observe, in various degrees of desiccation, to different parts of the nasal and naso-pharyngeal passages.

The general health of these patients is better than that of the preceding class, yet they all complain a little of lassitude. They are all troubled with much hawking and spitting, not of saliva, but of the secretion which collects in the nasal passages and in the naso-pharynx. In one—the eldest, sixty years of age—there is marked atrophy of the pharyngeal mucous membrane, in strong contrast to the condition of the nasal membrane. These cases which are grouped in the third class are all very chronic, indeed of such long duration that it would be impossible to tell when they began.

The question of the treatment of these cases now arises. Shall they all be treated alike? By no means. The first group will need little if any local treatment, excepting perhaps a spray at night of a two-per-cent. solution of cocaine in the nose or a few whiffs of chloroform from a sponge or paper cone. The principal treatment must be general. The case suffering from neuralgia ought to have gelsemium repeated every two hours during the attacks, in order to mitigate the paroxysms of pain, and, if possible, between attacks there should be administered a pill consisting of quinine and arsenic, three to five grains of the former and one-fortieth to one-twentieth of a grain of the latter, given every three or four hours for three doses. The case suffering from a cutaneous eruption, which is probably of neurotic origin, ought to receive a full dose of the bromides every night, and perhaps also during the day, preferably ten grains of sodium bromide and ten grains of ammonium bromide; also before each meal, well diluted with water, from ten to twenty minims of dilute hydrochloric acid. Of course, each individual case of this sort may need some particular treatment. For instance, those females whom we suspect are suffering from some uterine or ovarian disease will probably require no other treatment than that given by the gynæcologist. I cannot go into too much detail now, as my object is simply to indicate in a general way the management of these apparently similar yet dissimilar cases which we have grouped together.

The second group will need general rather than local treatment, for reasons already given. A spray or snuff of water containing a one-per-cent. solution of sodium chloride, used night and morning, to keep the nasal passages clean, may be all the local treatment re-

quired, although the additional use of a spray of hamamelis with a solution of potassium chlorate would be useful. In one or two of these cases the galvano-cautery might be necessary later on. In my earlier practice I frequently scarified these grayish-looking, swollen turbinated bodies, but after getting indifferent results I was soon led to abandon the practice.

Such patients require, as far as possible, better nourishment and the administration of the hypophosphites and the iron preparations, together with one or two doses of belladonna at night. One-fourth or one-eighth of a grain of the alcoholic extract at eight o'clock and another at ten will frequently secure for them a good night's rest and comparative relief from nasal stenosis. Strychnia, in doses of one-thirty-second of a grain three times daily, is highly useful in those cases characterized by alcoholic toxæmia, and often cinchonine or quinine with hydrastin will prove beneficial. The individual conditions of the case must be recognized, and such remedies administered as may be deemed necessary; for example, cathartics, either mercurial or saline, to relieve constipation. To one of these individuals before you, we shall order for to-night five grains of calomel and five grains of rhubarb.

The treatment of the third group, those showing marked structural changes and deformity through deviations and spurs of the nasal septum or turbinated bones, with true hypertrophy of the soft parts, must be mainly local. Surgical measures will have to be resorted to, as no medicinal applications which I know of will serve to relieve these conditions. The two cases showing deviation and deformity of the septum will have to be relieved by the use of the saw. After that, if necessary, the hypertrophied tissue will be treated by applications of the galvano-cautery knife, care being taken that as little tissue as possible be destroyed, lest we fail of giving proper permanent relief to the parts. You will notice that we use the galvano-cautery as an escharotic generally instead of chemical agents, such as chromic, nitric, acetic, or lactic acids. We have already given you the reasons for this preference in the didactic lectures, so that it will not be necessary to repeat them here, except to reiterate the fact, that with the galvano-cautery you are able to accomplish the destruction of just that amount of tissue which you desire, and no more. One of these cases, showing enlargement of the pharyngeal and palatal tonsils, will be more extensively treated

with the galvano-cautery, until all mechanical obstruction to respiration is removed and desirable changes in the secretory function of the mucous membrane have been brought about. To one of these cases—the one suffering from occasional asthmatic attacks—we shall administer either Lugol's solution of iodine, five minims three times daily before meals, or syrup of hydriodic acid, or potassium iodide. In the case which you have just seen, with the enlargement and deformity of the lower turbinated bone, we shall use the drill, tunnelling one or two grooves in the bone beneath the mucous membrane.

In conclusion, I will emphasize the points demonstrated by our clinic of this morning,—namely, that hyperæmia of the turbinated bodies is not necessarily hypertrophy; that even beyond the point of apparent moderation it may be no indication of local disease, and therefore will frequently require little if any local treatment; that a moderate degree of either hyperæmia or effusion in these bodies may be simply an accompaniment of a general or remote disorder; that even moderate deformity of the cartilaginous or bony parts may be compatible with perfect health, and therefore may need no artificial interference; that when true hypertrophy or pernicious deformity exists about the nasal, naso-pharyngeal, or pharyngeal passages, which obstruct, impede, or alter the functions of these parts, or produce continued local or reflex irritation of any sort, then there should be no dilly-dallying with medicinal sprays, douches, ointments, or powders, but, on the contrary, summary measures—either by escharotics or surgical implements—are to be adopted in order to remove the offensive or redundant tissue as far as practicable.

Make a study of each case and act accordingly. Avoid routinism, for it is the enemy of all good therapeutics.

PHTHISIS PULMONALIS.

I expected to show you this morning two cases illustrating so-called hemorrhagic phthisis, each being a distinct type of the condition characterized by hæmoptysis; but as the patients have been allowed to go out, I shall consume the time in making some remarks on the climatic treatment of phthisis pulmonalis. This is an all-absorbing topic, as you doubtless know, and a plan of treatment which at the present time probably enjoys the highest professional favor. This plan, however, has been very carelessly employed,—

indeed, quite as much abused as the old remedy cod-liver oil,—
because of the influence of fashion instead of judgment in deter-
mining the character of our medical advice. It has been the fashion,
for instance, at one time to send the majority of patients to Texas,
at another time to Florida, to California, to Colorado, to Minnesota,
to the West Indies, and so on, without proper discrimination. Like-
wise, fashion has played the most important part in the selection of
the various mineral-spring resorts in the treatment of this and other
chronic affections. So that I am sorry to say we have been more in-
fluenced by impulse than by judgment in sending away our patients.
Climatology, as a branch of medical science, is still in its infancy;
consequently, we have but few fixed principles for our guidance.
There are, however, a certain number of recorded observations
which have established the fact that while one class of cases may
derive considerable benefit from a prolonged sojourn in particular
localities, another class may not, and the reason for this is not always
obvious. In studying the effects of climate it will be necessary
always to pay particular attention to the elements of the subject, such
as location, altitude, temperature, conditions of the soil (embracing
drainage), conditions of the atmosphere (embracing the amount of
sunshine, dust, etc.). In recommending a patient to a given place
it is highly important to give due consideration to the environment,
by which I mean domiciliary accommodation, food, cooking, and
companionship. A patient may go to one of the most equable of
climates, such as the Seychelle Islands, but if there be scarcity of
good food, or if there be poor cooking, the climate will avail him
little or no benefit. This is a point which I hope you will remem-
ber, because it is a common thing to hear, and to know, of patients
having been sent south or west without a thought of anything but
the mere effect of climate. Not infrequently a patient quite well
advanced in phthisis, suffering from high temperature, persistent
anorexia, and diarrhœa, will go to a remote sheep-ranch where the
bill of fare consists principally of bacon, salt pork, dried beef, beans,
potatoes, and bread made of third-class flour, with a hope of regain-
ing health. Moreover, this person will be urged to ride around with
the cow-boys among the stock in order to get an appetite. It is ob-
vious, in this instance, that the patient is really aiding the progress
of the disease by burning the candle of life, so to speak, at both ends.
Let me emphasize the point that climate never compensates for the

failures of nutrition. You will find many places that are highly extolled as almost perfect residences for consumptives, where people will show you convincing statistics regarding temperature, humidity, etc. But I say to you beware of partial statistics; always inquire into the nature of the changes of weather. It is an old saying that figures never lie, but, as a matter of fact, tables of mean temperature and humidity, even when taken from the signal service reports, are manifestly inadequate to convey a correct idea of the climate of a locality when taken alone. For example, Detroit may be regarded as unsuitable for the majority of cases of phthisis pulmonalis, on account of its low altitude, cloudiness, and sudden changes of weather. Yet if you will carefully consult the tables of mean temperatures and humidity for two or three favorable years, you will be astonished to find that our climate compares very favorably in salubrity with Virginia, Tennessee, or North Carolina. Hence you see that statistics may deceive when they embrace only a portion of a given subject.

The beneficial effect of a climate for a consumptive, generally speaking, does not depend so much upon mean temperature, or upon mean humidity, as upon the absence of frequent and sudden changes. Moderate winds, moderate temperature, clear atmosphere, and sunshine may very properly be considered the most important factors of a good climate. Wise discrimination in selecting a climate suitable to your case should be your rule of action; for instance, three persons in about the same stage of disease may go to the same climate, we will say New Mexico: two of them will not improve there, while the third may not only improve rapidly, but may recover. You will ask, What makes this difference? The answer may be found in the individual conditions present.

There are some cases which seem to need high altitude, others which do not; some cases derive the most benefit from a *cold*, dry climate, while others require a *warm*, dry climate; still other cases improve only in a warm insular climate or on the sea-coast. As to surroundings, the mental stamina of your patient must often constitute your principal guide in the selection of a climate or locality. While the beneficial effects of altitude upon many cases of phthisis pulmonalis are too well known to need much discussion, yet there are certain exceptions which you must carefully observe. For instance, persons of highly nervous temperament, also those having a

marked tendency to hæmoptysis, and women who have suffered from derangements of ovulation, should be restrained at least for a time from reaching very high altitudes. The reason of this is that the rarefied atmosphere at such elevations immediately produces marked acceleration of respiration and circulation, thus demanding the expenditure of increased nerve-force to maintain the equilibrium of these functions. However, the marked preference shown for high elevations as a remedial measure for "consumptives" is largely based upon the theory that intense and continued sunshine, with dry, rarefied air, will destroy the potency or life of the tubercle bacillus, which germ is by many considered the sole cause of pulmonary phthisis.

Cases of fibroid phthisis and imperfectly resolved pneumonias will often do better in a warm, moist or a sea-coast climate. Under such conditions expectoration is favored, annoying dry cough allayed, and the skin kept in such an active condition as to favor metabolic changes in the internal organs. More advanced cases with large cavities may be sent, with the expectation of benefit, to hot, dry climates, even though they be dusty. Cases showing a great deal of bronchial catarrh, especially in those who are tolerably strong, sometimes improve nicely in insular climates, such as the West Indies or the Bahamas, but you will find that more often such patients are better suited by living in a warm, dry elevation having an equable temperature and an atmosphere not laden with dust.

Cases of laryngeal phthisis are quite difficult sometimes to dispose of. However, as a general thing, it is best to send them to a place of moderate altitude, of equable temperature, with an atmosphere free from fog or dust. A dusty place, whatever may be its other advantages, is unfit for a case of laryngeal phthisis.

I would like to say a word with regard to the season for patients to seek these various climatic resorts. It is unwise to send patients from this region to Northern Colorada, Montana, or Nevada, or to the Northwest Territory (excluding the Pacific coast), in the winter season, on account of their liability to contract acute pneumonia. Even healthy persons may be so afflicted by such a change in midwinter. I would also impress upon you the risk of sending persons from the Northern States to the Southern late in the spring, or during the summer season, on account of their liability to attacks of malarial fevers and intestinal disorders.

In conclusion, let me call your attention to the necessity of study-
ing the habit and condition of your patient before determining the
change of location.   Do not send an active, industrious man or
woman to some quiet nook or corner where there is nothing to excite
attention or interest the senses.   Do not send a thoughtful, intellec-
tual, quietly disposed person to a frivolous health resort where there
is nothing higher than dress-parade and small talk.   Do not send an
irascible, nervous patient to a place inhabited by noisy, rollicking,
and carousing individuals, where peace of mind would be constantly
disturbed.   And, above all, do not send a poor, wretched, dying
consumptive away from the comforts of home to be brought back
in a few weeks in an express-car.

ANTISEPSIS IN THE TREATMENT OF THE SKIN-DISEASES OF CHILDREN.

BY ARTHUR VAN HARLINGEN, M.D.,
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GENTLEMEN,—If you will examine, one after another, these children whom I now bring before you, you will see that the skin affections which they present have one feature in common. They all show the presence of suppuration; pus or purulent crusts form the main feature, or one of the main features, in the picture presented.

This little patient displays the characteristic features of pustular eczema of the face and scalp. The scalp is covered with crusts matting the hairs together, while from the fissures in these crusts there exudes a purulent fluid in considerable quantity. The forehead and cheeks likewise show crusts which are partly purulent in character. The mother tells us that at first the cheeks became red and inflamed, and that water oozed out, but the itching was so severe that the child scratched the places and "poisoned it with the nails." Note this expression. The popular idea has always been that scratching the skin introduces a poison. This notion, as it used to be called, is now known as a fact. In my earlier practice I, with other dermatologists, used to smile at this ignorant prejudice, but as we now know that under the finger-nails lie concealed various noxious bacteria, we are able to confirm the general opinion and to give a scientific reason for what we formerly deemed a mere fancy without basis in fact.

The second patient I show you displays the skin affection known as impetigo. The little one is poorly nourished, and has evidently suffered from privation, improper food, and unhygienic surroundings. She displays upon the lower limbs and to a less extent elsewhere an eruption of discrete, isolated, crusted lesions. The more recent ones take the form of small pustules, while the larger ones

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look like a splash of mortar. If you look more carefully at these larger lesions, you will see that they show a narrow, shallow ring of ulceration around the margin; and if you will look at this one from which I now lift the crust, you will see that while the centre is dry or only slightly moist, the edge is in a state of activity and shows slight but decided ulceration. Evidently this disease begins at one point and then, by some power of propagation inherent in it, proceeds and spreads in a centrifugal manner.

I am not lecturing on impetigo this morning, and consequently shall not go any further into the description of the clinical features of this case. I simply wish to point out the pre-existing favorable condition of the patient for the occurrence of a parasitic affection, and the appearances which show that some such agent has become implanted in the skin or has sprung into new life under this favoring condition, and is spreading and propagating itself.

The third case is one of multiple furuncles. This child displays a number of these lesions, none severe or extensive, but all highly characteristic. The mother says that the little girl suffered from excessive perspiration during the hot weather; that she was rubbing and scratching the "prickly heat" which ensued; and that these "boils" subsequently made their appearance, at first over the back of the neck and then elsewhere. Note, if you please, a large central boil visible here and there upon the neck, with pus oozing from it, and then see these smaller pustules or "pimples" surrounding the parent lesion like satellites. Is it not evident that we have here an active local agent of disease propagation, as in the other two cases just shown?

Yes; each of these affections has its origin in infection, and in each case the infection is the same. Not only so, but the infectious agent is, so to speak, a normal one, or, at least, is found in all normal skins, and especially under the finger-nails and about the openings of the skin glands and hair follicles. It is the *staphylococcus pyogenes*, with which, at least as regards its character and some of its manifestations, your studies have doubtless made you familiar.

The staphylococcus pyogenes is, as I have just said, a normal inhabitant of the external layers of the human epidermis. Here it leads a larval existence, if I may use the expression, concealed in the shingle-like epidermic scales or buried in the sebaceous secretions which protect the juicy interior layers of the skin from its invasion.

Like some beleaguered fortress, the human body is surrounded by these and other bacteria. They cannot mine the walls, or of themselves make any breach in them, but they are constantly prowling about, and, let but the slightest opening be made, they swarm in and make a local fight if in small numbers, or, if the resisting power of the system is small and numerous posts be once planted at various points simultaneously, the whole system may be impaired.

This may be a bold simile, but it will serve to impress upon your minds the principles of treatment which I shall shortly develop.

The avenues of invasion are usually opened by mechanical means. A scratch, an abrasion, a wound, or even the excessive use of friction with soap and water, may afford an entrance to the staphylococcus. The moment these bacteria reach a point where they can find appropriate pabulum, they immediately begin to pullulate, to increase and multiply at a great rate, and thus bring about, either by mechanical means or by the production of some toxin, certain inflammatory lesions accompanied by the formation of pus.

The delicate skin of childhood affords less protection than the more fully developed epidermis of the adult, and hence the readiness with which purulent eruptions occur in early life. Pustular eczema, impetigo, ecthyma, furuncle, perionyxis, and felon, or whitlow, are among the commoner affections of the skin met with in children. Go into the smaller streets and crowded courts of any large city, particularly in the summer, when diseases of the perspiratory glands are common, and at a time when debilitating heat has lowered the vitality of the inhabitants, and you will see one or another of these purulent affections of the skin at every step.

If you wish to see a practical example of the implantation of the staphylococcus, look at the leg of this patient with impetigo whom I have just shown you. Observe this pustular lesion, and see the long festering scratch leading from it; here you have the mark of the finger-nail, first loading itself with infective pus, and then ploughing this into the juicy sub-epidermic structures in a long furrow where the staphylococcus has flourished just as corn in a field.

Now, knowing the cause of these purulent affections, we are in a position to combat them with more intelligence and I think with more success than formerly. We cannot hope to prevent their occurrence entirely, but something may be done in the way of prophy-

laxis, as well as in the treatment of the coccogenic affections when they are fully developed.

It has been shown that the number of bacteria upon the skin is greatly diminished after bathing. Experience, too, has shown that cleanliness is not only a preventive of the ordinary parasitic diseases of the skin,—scabies, ring-worm, and the like,—but also serves directly and indirectly to diminish the number of cases of coccogenic disease and to mitigate the intensity of such cases as occur.

I have no doubt but that the increased use of public baths in cities like Philadelphia and New York will have a marked effect in diminishing the frequency of skin-disease among the poorer class of children. I only wish that the shower-bath were more generally introduced, as it is a much more cleanly instrument of ablution than the common pool.

However, this is a digression, and I shall pursue it no further. I wish to say, however, that ablution may be carried too far, and especially regarding the excessive use of soap. It must be remembered that the removal of the natural sebaceous covering of the skin exposes the latter to invasion of parasites from without, and also, in all probability, favors the penetration of those bacteria which have the horny epidermis as their normal habitat.

Antisepsis in the treatment of skin-diseases in children should be based upon the proper and intelligent use of baths, local or general. In private practice, and particularly in the case of infants, the unintelligent enthusiasm of mothers and attendants may carry ablution too far. It may sometimes become our duty to mitigate this excessive cleanliness, but I think more frequently we may do good by directing the degree to which soap should be employed and the kind of soap which should be used in each case.

To prepare the skin for active treatment we must not only reduce the number of bacteria upon the general surface, but we must remove all crusts and scales which can harbor and aid in the propagation of the staphylococcus. When crusts are easily detachable a simple washing will be sufficient; when they are more adherent a wet dressing or a poultice may be applied. Sometimes an oily application will serve best.

Whatever mode of cleansing we employ, however, antisepsis must be kept in mind.

For instance, if we give a bath, it should be not one of simple

hot water and soap, but should be so medicated that it may prepare the way and initiate the treatment. Thus, if a full bath is given, an alkali, as bicarbonate of sodium, should be added to soften the crusts, and some medicated soap should be employed. The subject of the employment of soaps in diseases of the skin is a large one and one into which I cannot enter at present. This much I may say, that medicated soaps, in my opinion, act an humble but not unimportant part in the treatment of diseases of the skin. To vaunt a soap as a "cure" for any skin-disease is, however, to be left to the makers of these materials. The true rôle of medicated soaps is a subordinate one.

Where the skin is not acutely inflamed, a tar soap is often the best that can be employed. Those in the market are for the most part crudely made and contain much too great a proportion of alkali, but they certainly possess some antiseptic properties. Care must be taken not to employ them when the skin is much inflamed.

The best medicated soaps at present procurable are those made under the supervision of Professor Unna, of Hamburg, and those known as "Eichoff's soaps." The latter are made in considerable variety, and according to the statements on the wrappers are a "cure" for most skin-diseases. In spite of this, however, they are well-made soaps, nearly neutral, and many of them of considerable value as antiseptic applications. In the class of skin-diseases of children which we now have under consideration the bichloride soaps of Eichoff have proved useful.

When the eruption we have to treat is more local, as in the case of the eczema of the scalp and face which I have brought before you, poultices and wet dressings are to be employed; but all these must be rendered antiseptic. If we soak the scalp with oil to soften the crusts, we must carbolize the oil; or if we use a wet dressing, the cloths must be wet with a saturated watery solution of boric acid. When this is taken off for the first time and a portion of the crusts are removed, the moist surface may be sprinkled with powdered boric acid, alone, or containing a small proportion of aristol, europhen, or some similar preparation.

By making repeated applications of this kind you will be able to clear the lesions of all extraneous matters, and often will succeed in reducing the intensity of the disease considerably before you begin the more active treatment.

When you have a more deeply seated inflammation, as in furuncle, the preliminary antiseptic treatment is a little different from that which I have just sketched. Perhaps I can best illustrate what I have to say by bringing forward again this little child who is suffering from the remains of a summer attack of miliaria, or "prickly heat," and a subsequent outbreak of furuncles.

We find, on stripping the little patient, that some few traces of miliaria remain; that there are numerous scratch marks, like lines of dried purulent exudation; and that there are a certain number of boils, none very large, but a group of which, composed of a single large lesion with surrounding satellites, can be seen nearly covering the nape of the neck. We learn from the mother that the original "boil" present was carefully poulticed with flaxseed, but that, "in spite of this," new lesions came out in the immediate neighborhood.

I do not know whether this method of treating furuncle is as universal as it was a few years ago. I have lifted up my voice against it at various times, and I am inclined to think that it is not employed so much as formerly. We know that heat and moisture soften the tissues and relieve the pain and tension in furuncle. But we also know now that heat and moisture favor the development of germs of all kinds, and the result of this treatment can be seen in the present instance.

The treatment of this case shall be as follows: The child is to be bathed daily in lukewarm water, with the use of tar soap. After the bath, boric acid is to be dusted freely over all the places where the irritation of the prickly heat remains. Then we come to the treatment of the boils. Each one is to be thoroughly cleansed by soap and then by light sponging with a wad of cotton dipped in alcohol. When the boils are open and suppuration is present, the orifices are swabbed out with a small splinter of wood covered with absorbent cotton. Then a strong germicide is to be applied directly to the centre of the little abscess. In this case we shall use pure carbolic acid, but there are a variety of similar applications which can be used. Where a pustule has formed this is to be pierced by a sharp stick moistened with carbolic acid.

You observe that I use no knives or other instruments, and that I employ fresh bits of stick and fresh cotton for each application. The reasons for this are obvious. The strictest antiseptic precautions should be employed in dealing with furuncle. No pressure should

be exerted to evacuate a ripe boil. Such pressure squeezes the germs into the adjacent tissues and really spreads the disease.

Now, after having gotten rid of the purulent secretion so far as possible, we sponge off the surface once more with alcohol, apply aristol to all the open points, dust the surface over freely with boric acid, cover the parts with layers of dry absorbent cotton, and fasten them in place with a bandage. And this procedure is to be repeated daily until a cure results.

The relief afforded by such antiseptic treatment as this is immediate, and we shall in this case need no more warm and moist applications. Should they be required, however, the poultice should be made antiseptic and kept so.

When a purulent inflammatory skin-disease is scattered superficially over the surface, as in the case of this child, who is suffering from impetigo, baths, with the employment of Eichoff's bichloride soap, should precede the local treatment. Many crusts will be removed by this means, and the moist surfaces left are then to be dusted with aristol or europhen. Other lesions, and particularly these numerous minute pustules which you see occurring at the orifices of the hair glands, are to be treated as I have described in the case of furuncle.

You will observe that I have not suggested the employment of ointments at any stage of the treatment. Even in the case of eczema of the scalp I have only mentioned carbolized oil to soften the crusts. After these are removed, powdered boric acid, with the addition of aristol or europhen, will be a sufficient dressing. Ointments should rarely or not at all be employed in purulent skin-diseases. When we have stopped the pus formation they will come into play perhaps in some cases. I cannot, however, dwell upon this form of treatment to-day.

I have now endeavored to sketch for you the principles of the antiseptic treatment of skin-diseases in children, illustrating my subject by detailing the method to be employed in the cases brought before you. These principles are worthy of your careful attention. They underlie the successful treatment of a great many of the more common cutaneous affections met with, not only in children but in adults.

In his earliest endeavors to cure disease the young physician is apt to employ certain well-tried or loudly recommended formulæ.

This is perhaps more the case in the treatment of skin-diseases than others.   It is perhaps inevitable at first.

But such formulæ are only like the leading-strings with which the tottering feet of childhood are guided.   The sooner we emancipate ourselves from them and learn to apply principles of treatment the more satisfactory will our practice become and the more fruitful our study of each new and difficult case.

TREATMENT OF INFANTILE URIC ACID INFARC- TION; TOILET OF THE INFANTILE PENIS; TREATMENT OF ENURESIS.

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GENTLEMEN,—This little child of four weeks of age has been brought to us with the following history: Birth normal in every way, and the first week without any evidence of functional derange- ment except a tendency to cry violently and spasmodically. The nurse informs us that the crying seems to precede the alvine and uri- nary excretions, yet during the first two weeks these functions were seemingly performed naturally. During the last week the distress has been decidedly augmented. On examination we find the child probably under weight, with apparent loss of the subcutaneous fat, slight depression of the anterior fontanel, a dry, harsh skin. The crying does not seem to be caused by handling, nor does it occur during nursing. The nurse informs us that immediately after a violent paroxysm of crying she finds the napkin slightly stained by a brownish-red fluid. This is the altered urine, the cause of the infant's distress. The diagnosis is easily made: it is one of the most frequent disturbances of early infancy,—uric acid infarction. The symptoms give rise to pain, in extreme cases—like the one before you—to violent spasmodic crying associated with the act of urina- tion, scanty urine, sometimes anuria, slight inflammation of the renal tubules, dry skin, and restlessness, and occasionally blood may be associated with the scanty urine. This condition occurs, more or less, in all children during the first two weeks of life. The older physiologists attached some importance to the presence of uric acid

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in very young children, regarding this as an evidence that the child, if dead, had breathed, thus giving the symptom some medico-legal importance. The condition has been found in still-born infants; so the supposed condition is not of value. The cause is evidently due to the excretion of uric acid before there is sufficient fluid to dissolve them, so the crystals form in the tubes. This condition is a very strong plea for plenty of water in the young infant's system. Bottle-fed infants are more frequent sufferers than those breast-reared, yet the trouble frequently arises in both. In both cases it would appear that the food was too frequently exhibited, or of too strong a nature. The urine of properly fed young infants is perfectly colorless, it will not stain the napkin at all; hence any departure from this standard must be looked upon as abnormal; this condition you must strive to gain at all times, and instruct your nurse and mother accordingly. The treatment is to correct the food if artificially fed, establish correct habits for maternal nursing if faulty, administer plenty of water frequently during the intervals of nursing, give some alkaline diuretic if the case is troublesome, such as citrate of potassium or liquor potassium. One grain of the citrate should be given in plenty of water every hour until secretion is freely established, or, if the staining of the napkin is decided, one drop of liquor potassium well diluted will bring relief within twenty-four hours. For the paroxysms of suffering I would suggest a warm body-bath, or hot fomentations around the trunk, or, if necessary, five drops of spirits of chloroform in water every ten minutes. In very troublesome cases a high enema of bichromate of soda, twenty grains in two ounces of warm water, will relieve the renal spasm.

TOILET OF THE INFANTILE PENIS; PHIMOSIS.

It is very important for you to see that the toilet of the infantile organ is properly attended to before you discharge your patient when you are through with your accouchement. A long adherent prepuce is not only a source of great irritation to a child, but is also the forerunner of bad personal habits. It is your duty as a physician to instruct the mother and nurse how to accomplish the retraction of the foreskin, and to see that it is persisted in frequently. I am constantly meeting cases which require circumcision later in life, owing to this procedure having been neglected in early infancy. The method usually requires no cutting; the foreskin is retracted

sometimes with considerable force, when a pinhole orifice is noticed, there is a little bleeding, and behind the glans penis is seen a quantity of smegma, which can be rolled off as easily as the skin peels off an orange. The parts are then bathed with a little sweet-oil, and the mother is instructed to repeat this process three times a week, and finally twice a week. I can hardly over-estimate the great importance surrounding this duty to your little patient. Outside of rendering cleanliness possible, phimosis most frequently leads to balanitis; this in itself will render an otherwise healthy child restless and nervous, distressing its waking hours and rendering its sleep broken. It may soon pass on into a urethritis, and possibly a cystitis with all its distressing associations. Phimosis, if at all complete, will soon develop a straining, and this may produce hernia (I have seen umbilical as well as inguinal hernia caused by it), and to cure this condition is impossible until you remove the active factor in the case,—the phimosis. In intimate association with phimosis we may develop another train of complications. If the abdominal walls are strong they may remain intact, but the constant straining may produce prolapsus ani, and by long pressure on the spermatic vessels lead on to hydrocele. Inviting your attention still more closely to the subject, you will see that this unnatural condition of affairs may light up a long train of reflexes, resulting from long-standing irritation. The prepuce adhering to the glans may render the urethra unusually hyperæsthetic and pruritic, with painful and frequent priapism, which in a short time will be an ever-constant invitation to masturbation. Phimosis, again, will produce such nervous symptoms as insomnia, night-terrors, frequent and unstable micturition, painful micturition by reason of the over-sensitive urinary channel induced, spasm of the bladder, retention very frequently and late in child-life, nocturnal and possibly diurnal incontinence. This list of reflex phenomena associated so closely with phimosis may be greatly lengthened so as to include most all of the functional derangements of childhood. I have seen undoubted chorea placed at rest by freeing the glans penis of the adhering prepuce. *Convulsions* are frequently provoked by this condition, and, if long continued, epilepsy may be the final ending of the neglect. Many hysterical joints and spines in young boys with perverted temperaments and nervous delusions at times find explanation and solution in a closely adherent prepuce. Spasm of the lumbar muscles and legs so as to suggest

joint trouble is not an unusual outcropping of the condition.   I would warn you, however, against the too radical decision that the condition will produce all the constitutional and functional troubles of childhood; many healthy boys, well balanced and free from all nervous phenomena, may have an adherent prepuce.   Do not over-exaggerate the importance of the condition.   I would suggest that the proper limit would be this: a weak, ill-nourished child will have his reflexes unstable; here relieve any condition that would constitute its excitement.

ENURESIS, OR INCONTINENCE OF URINE.

Your physiology teaches you that young babies have no control over their micturating centre, and that with them the bladder is scarcely more than a little reservoir which fills up and as quickly runs over.   Young babies are not only unable to control the contents of their bladder, but the urine passes unconsciously.   As the child advances in life it acquires more and more control over itself, and with the formation of proper personal habits and the exercise of a little will power, at the expiration of from eighteen months to two years a child can be so moulded as to clean personal habits that it will not soil its napkin, but will intimate when it wants relief.   From the third to the sixth year there seems to be a perfectly natural state of true incontinence which is hard to account for, unless it be the rapid development of the nervous system coexisting with some of the infectious diseases.

Enuresis as it is generally understood refers to nocturnal incontinence, the child being able to control its bladder during the day. To-day we have to deal with cases of two kinds,—diurnal as well as nocturnal incontinence.   The child before you, who had nocturnal incontinence and was cured, but still has diurnal incontinence, presents the following history:

Willie Z., ten and a half years old, was breast-fed for fourteen months; was a perfectly healthy baby; had no particular trouble during dentition, but has had whooping-cough very severely.   Enuresis is frequently known to follow whooping-cough, measles, and diphtheria.   When five years of age the family physician recommended circumcision, but when he came to do the operation he concluded that drawing back the foreskin would be all that was necessary, and subsequently, although the parts were kept clean, diurnal

incontinence resulted. This operation cured the nocturnal incontinence, but the diurnal incontinence, which came afterwards, was a source of great inconvenience and annoyance from the constant dribbling of urine on the boy's clothing. When seven years of age he was circumcised by another physician, and has since developed mentally very rapidly, manifesting no shyness or nervousness when in the presence of older people; but the operation did not cure the diurnal incontinence.

Enuresis is a very common disorder among children, and in your practice you will meet with scores of cases which will baffle your skill and that of the whole Pharmacopœia to effect a cure. If you can thoroughly analyze the cause, you will be able to cure the infirmity. The present case we find was due to a contracted meatus, and in ignorance of this he has been drugged with many remedies for years to relieve the supposed irritability of the bladder, besides being subjected to two operations under ether. There are many causes of this disorder, which we will take up one by one.

The first and most frequent is a *too acid urine*. The urine is normally acid, as we know, but it is possible for it to become excessively so, or, if there is a radical defect in the digestion, the urine becomes overcharged with uric acid, which teases and annoys the bladder just the same as a piece of sand in the eye or a mass of undigested food in the intestinal tract irritates those parts.

The second cause is *too large a quantity of urine*. Before we can prescribe correctly for enuresis it becomes necessary for us to analyze the urine, to find if possible whether we are dealing with an overly acid urine, or a case of diabetes mellitus. Excluding these causes, we find in children a tendency to ingest too much fluid, in the shape of milk, water, or fruit, early in the evening, with the natural result of an over-distended bladder, the contents of which the child is not able to retain during the whole of the sleeping-hours.

Another not unusual condition causing enuresis is a *calculus*. The uric acid deposit previously spoken of may form and grow in the bladder until, by constant irritation and teasing, it will finally provoke expulsion. A sound, or the analyzing of the urine, will clear up your diagnosis.

Many causes are local, such as *phimosis*, contracted meatus, ascarides, and some malformation of the bladder. The most frequent of these causes is phimosis. As in the case of the child just

shown you, the prepuce becomes glued fast to the head of the penis, forming permanent adhesions. The mouth of the meatus becomes connected with the edge of the prepuce, making the mucous membrane of the two almost one. This state of affairs teases and irritates the delicate nerves situated there, causing a reflex contractility of the bladder, and resulting in incontinence of the urine. Constipation, a loaded rectum, and causes leading to constipation will also produce enuresis.

In the case before us we found a pinhole opening in the meatus, leading to hyperæsthesia of the urinary tract. You noticed the child was so sensitive that he became choreic in his movements when we touched the meatus. Eliminating all other causes of enuresis, we arrived at the conclusion that the child before us was a case of contracted meatus, but it seems curious that he should have had diurnal incontinence instead of nocturnal.

A psychical cause of enuresis is frequently present. A child may have an irritating urine in conjunction with a loaded stomach, and upon retiring there will result a train of psychical pictures which pass through the child's mind while asleep. The child may dream of an opportunity to empty his bladder, and he does so. Weakness of the sphincter vesicæ, resulting from constitutional troubles, such as scarlet fever, diphtheria, or measles, may cause incontinence of the urine, the micturition centre in the spinal cord usually being the seat of the trouble.

Malformation of the bladder is not an unusual cause. I recall a case in my private practice, that of a girl sixteen years of age, well developed and generally healthy, who was troubled with both nocturnal and diurnal incontinence. I analyzed every possible cause likely to produce it, and after a great deal of careful study and trouble discovered that she had a misplaced ureter, which, instead of terminating at the base of the bladder, as normally found, emptied on the valvæ external to the sphincter vesicæ.

The prognosis of enuresis depends largely upon the condition in which you find your patient, and the duration of the disease and its cause. Many local and constitutional causes may be removed; but do not fall into the error which so many physicians entertain, and, after having tried a certain number of drugs and given them a reasonable amount of time, dismiss the case with the idea that the boy or girl will or must "outgrow" it, or think that possibly nature

will right herself at the age of puberty. This is a common and grave error on the part of a great many practitioners, and I believe that puberty is postponed on account of this disease, and there is a perceptible failure of development of the genito-urinary tract, as well as the whole mental condition.

The treatment of enuresis is naturally divided into *local* and *constitutional* measures. If, as in this boy's case before us, the incontinence is on account of the micturating centre in the spinal cord not being sufficiently strong to preside over and control the sphincter vesicæ, our attention is directed to the removal of that cause by toning and strengthening the nervous system.

If the urine is overly acid, neutralize it. Give three to four drops of liquor potassæ every two or three hours, well diluted in mucilage water, for a child five years old. If due to too strong an expulsion of the urine or to too strong a contractile power of the bladder, the drug which will have the greatest influence to remove this cause is tincture of belladonna, ten drops every three hours up to the physiological limit,—*i.e.*, flushed face, dilated pupils, and dry throat. Usually three or four doses are sufficient to produce this effect. When we have reason to suspect a weakened sphincter vesicæ, due to some wasting disease or spinal disease, we should administer a tonic in the form of ergot or strychnine, preferably the latter. A child is generally given too small a quantity of the drug; one-thirtieth of a grain three times a day is not too large a dosage for a child five years old. Ergot is ofttimes advantageously combined with strychnine.

Position in bed ofttimes exerts considerable influence upon this disease, especially when associated with weak sphincter vesicæ, which can be readily seen when you take into consideration the position of the bladder in the pelvis. It is a reservoir, with its outlet slightly above the fundus, which holds a certain amount of fluid until it reaches a certain height and the sphincter is impinged upon. By elevating the foot of the bed and depressing the head, a child's bladder can be made to hold more, and thus get longer rest without the escape of the contained fluid.

Hygiene also plays an important rôle in the treatment of enuresis. Cleanliness must be observed; the formation of proper habits must be looked after. A great many cases of incontinence are the results of parental neglect in this regard. A child should be early

taught to sit on a vessel after meals, and after this is repeated several times it will soon come to know what it is expected to do, and properly formed habits will result.

To recapitulate: our prognosis and treatment rest on the cause, wholly. The infirmity is hopeless if dependent on real diseases of the brain, or if due to malformation, as in the young lady of sixteen, unless she is subjected to a serious and questionable operation. The age of the child and the duration of the trouble influences our prognosis. The younger the child the better results we may hold out. If the cause can be discovered, the more hopeful the recovery.

A most important statement comes in here. Never make a favorable prognosis until you have had your case under observation for at least one year, and then after the child has been well for several months, as there exists a very decided tendency to relax discipline.

Briefly reviewing our treatment, I wish to broadly state: Remove all the causes which may be found. Break up all preputial adhesions. Remember the toilet of the infantile penis. If decided phimosis exists relieve it by stretching or by circumcision. A narrow meatus, as in the young lad I show you to-day, will be relieved by the use of a graded sound or by slight cutting of the meatus; usually the sound will answer. Pin-worms in the rectum should be removed by a cleaning out of the bowels, by proper diet, a course of calomel and soda, and followed by daily injections of infusion of quassia. Acid urine calls for alkalies and the free use of water, with regulated habits of feeding. The mental life of young boys should be watched; they should have an easy, uncrowded existence, not too much study, no overtaxing of brain, at school or at home, no excitement; early to bed, a clean body, plenty of sleep in a clean bed with light coverings and in a large and well-ventilated room must be insisted upon.

The diet must be simple. Avoid coffee, tea, beer, sweets, and all highly seasoned food. Meat may be allowed, and I find it advantageous in many cases. The diet should be regulated to suit individual digestive capacities; the one that succeeds the best is a simple one of milk, fruit, vegetables, when fresh, fish, meats, and all the cereals.

One word about the moral treatment. It has frequently been my painful duty to interfere with the parental decision when it has administered punishment to a weak, nervous child for bed-wetting.

Punishment, especially moral,—such as placing the child in a dark room or in bed,—does no good; on the contrary, it is fraught with much evil. Corporal punishment is worse than useless; it is emphatically harmful, and should be discountenanced in every way. Rewards inspire to mental effort and result in good. The spirit of the child must be awakened; work on the child's pride, appeal to his manliness, stimulate his will, but never punish; it is degrading, and results in crushing the last flickering will-power and pride of the child.

Medicine.

HÆMATURIA.

GENTLEMEN,—I want to spend a portion of the hour to-day upon a symptom which needs no patient for its demonstration, being itself often the sole condition manifest. I refer to hæmaturia, or bloody urine, of which I present some samples.

Hæmaturia, like albuminuria, is a symptom, not a disease. It is, however, often of advantage to consider a symptom in connection with the various conditions which are responsible for it, in order that we may the better understand these very conditions.

According as the quantity of blood in a sample of urine is large or small, the appearance differs. The quantity may be so small as not to influence in any way the color, and yet the microscope will enable one to recognize blood-corpuscles, and the urine will be bloody in one sense; larger quantities of blood than this, but smaller quantities than in the sample I show you, give to the blood a very peculiar hue, which to one of experience is pathognomonic of blood. It is the so-called "smoke" hue. If the urine is acid in reaction, the presence of a small quantity of blood gives rise to this peculiar "smoky" hue. I do not know that it particularly resembles smoke, yet it has an appearance which is quite distinctive, and is occasioned whenever a small amount of blood is present in an acid fluid. If such urine is alkalized, the smoky hue will become a reddish tinge. The same appearance due to blood is found in other acid fluids; for instance, in vomited gastric matter. When blood is present in still larger quantities in the urine, it gives to it a true blood-color, as the second sample shows. When there is a subsidence of the cor-

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puscles of the blood, there results a dark-brown or red sediment, which under the microscope is resolvable, of course, into blood-corpuscles. Again, the blood may be so copious that there will be actual clots in the urine.

Now, given a case of hæmaturia, recognized either by the naked eye or by the microscope,—and you should never decide that red urine is bloody urine unless you do use the microscope,—what are the further characters of the urine? First, it will be found albuminous, and the amount of albumin varies with that of the blood. The albumin here, as in the case of pus, is not in the corpuscles, but in the serum of the blood, and if you filter off the blood-corpuscles the albumin still remains. I have already cautioned you, with reference to pus, that after filtering off the pus-corpuscles you have not got rid of the albumin.

The next question to be decided is the source of the blood. Does it come from the bladder, from the kidney, or from the urethra? The latter is so rarely the source of blood that it need not detain us long. In case the blood does come from the urethra, it will be found in the first portion of the urine passed. By taking two vessels, and collecting the first drachm or two in one, and in the other vessel the larger quantity which comes later, we may decide whether the blood comes from the urethra or not.

It is not so easy to tell whether blood arises from the bladder or from the kidney. There are certain criteria, however, which, when present, enable us to say with absolute certainty that the blood does come from the kidney, although they may be absent and yet the blood may still be renal in origin. As a rule, the blood which comes from the kidney is more liquid, and it is less apt to be associated with irritation of the bladder, as manifested by a frequent desire to urinate. Where you have blood-clots and a frequent desire to pass urine, it is a point in favor of the vesical origin of the blood. Again, if the blood which you examine contains blood-casts,—i.e., casts of the uriniferous tubules made up of coagulated blood, or the ordinary fibrinous hyaline base with blood-corpuscles in it,—the evidence is conclusive that the blood comes from the kidney. Again, while it is true, as I have already said, that irregular fragmentary particles of clot are more apt to come from the bladder, yet there is a certain form of blood-clot which is conclusive evidence that the blood comes from the kidney or its pelvis, and that is the worm-like clot

which is a mould of the ureter. These moulds are of various sizes; and although the ureter is small, it is capable of considerable dilatation, and thus moulds a third of an inch in diameter may form, although they are usually smaller, say an eighth to one-fourth of an inch. These two features—the presence of the blood-casts and the moulds—make it certain that the blood comes from the kidney; but unfortunately, their absence does not disprove this source of the blood.

Blood comes from the kidney and from the bladder as a result of stone in both of these situations. The quantity is not large, as a rule, in either instance, but we are generally enabled to settle the question by the attendant symptoms. Given a stone in the kidney which causes hemorrhage, we have the ordinary symptoms of nephritic colic, those terrible pains which start in the region of the kidney and shoot down into the groin and testicle, and which constitute one of the severest forms of pain from which man suffers. Crystalline sediments may be associated with such pain, but by no means always. Again, if a stone of large size is impacted in the kidney, it is likely that there will be pain on pressing over the kidney region. The kidney may also be enlarged, but it is not easy to recognize a moderate enlargement of the kidney by percussion or palpation. If the hemorrhage is due to stone in the bladder, you have the symptoms of irritated bladder,—pus mixed with the blood, and frequent micturition. Symptoms like these suggest an immediate sounding of the bladder, and this would probably settle the question.

But these do not include all of the causes of hæmaturia. There are cases of hemorrhage from the bladder in which there are not the decided symptoms referred to of irritation of the bladder. All these may be present in a moderate degree, or they may be absent, and yet the hemorrhage be from this source. In such a case as this the instrument which has been lately devised for the exploration of the bladder by the electric light is most useful. In my experience during the last year two cases of tumor of the bladder have been diagnosed by this instrument, the endoscope; one, a case of papilloma of the bladder that had exhausted every other source of information, was shown very plainly; the other, a case of sarcoma of the bladder, was similarly recognized. These cases were operated on, and the first got well; the second perished, unfortunately, soon after operation. There comes a time in the exploration of many cases when you will

have to use the endoscope. It is a troublesome instrument to use, and requires skill and experience to be able to manipulate it with success.

Another cause of hemorrhage from the bladder is a varicose condition of the veins at the neck of the organ. The hemorrhage differs from that of a papilloma in that it is very decidedly intermittent. It may occur once and not return for a long time, or perhaps never again, whereas the hemorrhage due to morbid growths is copious and keeps up; it may stop for a day or two, but go on for weeks and months or even for years. Hemorrhage into the bladder from varicose veins is often very large.

In the case of a woman the exploration of the bladder is very much simpler. We can dilate the urethra by means of the finger or by Simon's cylinders, which are made of graduated sizes. The operation is painful, and it is necessary to etherize the patient, introducing first the smallest cylinder, and then a larger one, until you get to the largest, or next to the largest size, after which the finger can enter the bladder and explore it by feeling around. The endoscope is scarcely necessary in the case of the woman, though it is also much easier used than in man. These include the more common causes of hemorrhage of the bladder.

Now let us return to the kidney and the causes of hemorrhage there. First, a very slight hæmaturia occurs in acute Bright's disease and more rarely in chronic Bright's disease, not enough to tinge the urine, as a rule. There remains a cause of hemorrhage which is intermittent in its action and which gives rise to a hæmaturia correspondingly intermittent. One form of this is malarial in its origin, and is very easy to diagnose by the therapeutic test, if not by any other. A few doses of quinine, three grains every three hours, will invariably, in my experience, stop it if it is malarial. At least, this is true of the milder forms of hemorrhage which occur in the northern part of the United States. There are other symptoms which would suggest malarial hæmaturia, in addition to the hemorrhage: immediately before the hemorrhage comes on, sometimes the patient has a chill, or chilly feeling, or his nose and the ends of his fingers become blue and cold.

Again, hemorrhage from the kidney is the result of malignant disease. Here we are helped out by various circumstances, but we have often to wait until the cachexia due to it develops, and which

may first suggest the diagnosis. It comparatively rarely happens that portions of a malignant growth descend into the urine and permit recognition by the microscope. It does, however, sometimes happen. Within the last two years, I have been able to recognize a case in this way. In addition to the blood in the urine, there were a large number of cells, multinuclear, and of the character of those which are found in connection with cancer, but which of themselves are not diagnostic; also a large number of granular fat-cells, showing that the kidney was breaking up. To these were added tenderness over the kidney, the utter futility of treatment, and the gradual production of cachexia. So characteristic is this urine sometimes that I had an interesting experience connected with it. A sample of it was brought to me by a physician who did not mention the circumstance to his patient. I examined it and noted the results. In a short time the patient brought me a sample without informing his physician. From the results of this examination I made up my mind that the urine was from the same case. And so it proved. Carcinoma and sarcoma are constantly confounded. Sarcoma is a disease of early life; in fact, sarcoma of the kidney often begins to develop before birth. The child is born with a big tumor, which enlarges and soon causes its death; and these tumors are easily recognized. Clinically it makes no difference whether we have to deal with a sarcoma or a cancer, the ultimate result is the same,—death.

Now, after eliminating these cases, there still remain a number of cases of hemorrhage from the kidney which we cannot explain by any morbid state of the kidney itself or by malaria. They constitute another variety of intermittent hæmaturia. A few of these may be classed in the category of purpuras, of which I have spoken in a previous lecture, and are thus explained; and a few are instances of that singular disease, hæmophilia, where there is a tendency to bleed from mucous membranes, more particularly from a slight wound, as the extraction of a tooth. Cutting out all these, there still remain some which are inexplicable, and these, for want of a better term, we call idiopathic hæmaturias. Of course, it is not worth while to discuss the pathology of these unknown states. There is some state of the capillaries of the kidney by which the blood is allowed to transude, or it may be some condition of the blood itself, because we can produce these conditions by the administration of certain poisons, such as carbolic acid.

The *management* of these different cases of hæmaturia, where there is an evident cause, is the management of the cause. I need not dwell upon that, but will pass on to the treatment of the cases where a cause cannot be arrived at, cases which are, if you please, idiopathic. The use of various astringents is universal and justified by experience. The one we naturally try first is tannin, or its active principle, gallic acid, which is more available than tannin for internal hemorrhage, for the reason that tannin is converted into gallic acid in the blood and is excreted as such. Where you have hemorrhage from the stomach, or external parts where it can be reached by tannin as such, this drug is to be preferred, but where it is from the kidney, it is better to give gallic acid at once. It should be given in full doses, fifteen grains every three or four hours. These hemorrhages are not so large as to endanger life, and extreme haste is unnecessary. Acetate of lead is given under the same circumstances, in doses of three grains every three or four hours. Better than these is the persulphate of iron in half-grain doses three or four times a day in pill. The tincture of matico in drachm doses is recommended. Recently, Dr. H. H. Levy, of Richmond, Virginia, has recommended the tincture of guaiacum in fluidrachm doses every four hours as an efficient remedy for hæmaturia, more particularly when associated with catarrhal conditions of the urinary passages, but also in other forms of hæmaturia. A certain number of cases yield to this treatment; but one of the best remedies in my hands in the cure of these purely idiopathic cases is some one of the natural astringent mineral waters, and of these the Rock Bridge alum-water is the best. About this time last year I gave a clinical lecture on a case whose hemorrhage we could not explain; he was put on this water, and the hemorrhage disappeared. Here we had explored the bladder, with negative results. In the absence of the natural mineral water, it seems curious why alum, in solution, would not answer just as well; and I do not know that it would not, as I have not given it a trial. It is easy to get the Rock Bridge water, and it is pleasant to take when it is cold; but in the absence of this and failing in other measures, I should make use of the alum in solution,—a half-drachm of alum to a pint of water,—and of that take a wineglassful four times a day. Of the Rock Bridge alum-water give two to four ounces at a dose, beginning three or four times a day, between meals and on an empty stomach, so as to have the astringent get into the blood undiluted

and reach the point of hemorrhage where it can exert its astringent effect. It should not be given at meals because it also interferes with digestion.

Occasionally you will find a case which will resist all treatment, and yet the patient does not die, but lives on for years in this condition, which may pass away of itself after a little while. I have seen such cases. It is not an alarming condition. Having taken great pains to eliminate a discoverable cause, you can give your patient considerable assurance that life is not jeopardized by it. Of course, anæmia occurs, as a consequence of these hemorrhages long continued, and the patient requires to be built up, and for this purpose arsenic and iron are useful; and in some cases of malarial hæmaturia where quinine fails, arsenic may effect a cure. I desire to say again that the malarial hæmaturia to which I refer is the milder form occasionally met in the Middle States. With the severer form of the far South I have had no experience.

ADDISON'S DISEASE.

CLINICAL LECTURE DELIVERED AT THE VIENNA GENERAL HOSPITAL.

BY EDMUND NEUSSER, M.D.,

Professor of Internal Medicine in the University of Vienna and Visiting Physician
to the Krankenhaus, etc.

GENTLEMEN,—The patient whose illness will occupy us to-day comes to the clinic now for the second time. Just about a year ago she was under treatment in our wards for a very different affection from the one she is now laboring under. An etiological connection between the two conditions is not easy to trace positively, but one is strongly tempted to think that they are related. She was admitted to the hospital July 6, 1896, with the following history: Father and mother living and well; five brothers and sisters died in early childhood from diseases unknown to the patient; four others are living and well. The family history may be said to be absolutely negative.

Personal History.—The patient was well up to her fifth year, when for five weeks she was laid up with a broken leg. At six years of age she had measles; at seven, scarlet fever. This last was severe, and she was confined to bed for five weeks, but she says that she recovered completely and had no after-symptoms. Since her sixth year she has nearly always had four to five liquid stools daily; these were accompanied by some crampy pains and tenesmus. This has continued with slight intermissions up to the present time. (This, of course, is her history taken when admitted to the hospital a year ago.) She never suffered from nausea or vomiting. She had passing dry coughs, especially in the winter time, absolutely without expectoration, and has never had night-sweats. Three weeks before her admission to the hospital at that time, she was taken with cramps in the mid-abdominal region, more severe on the left than on the right, and with very troublesome pains in the sacral region. At the same time she suffered from headache and nausea, and tired feeling

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in the limbs. A little later she became subject to vertigo and ring-
ing in the ears. She says that she had no fever at any time during
her sickness.

Some weeks before her admission an eruption appeared on both
legs. It began on the inner side about the middle of each foot, and
gradually spread. The spots were dark in color, with a lively red
edge and a paler centre, and were from the size of a dime to a dollar.
Examination in the wards after her admission showed that this was
a purpura hæmorrhagica. After some days in bed the abdominal
pains disappeared, but her headache continued, her appetite was
small, and she suffered from constipation. The tired feeling could
not be shaken off, pains in her left side occurred when she walked
up-stairs, and nausea followed an omnibus ride.

Examination of her urine at once disclosed the pathological pro-
cess at work. Her first day in the hospital she passed but seven
hundred cubic centimetres of urine, with a specific gravity of 1020.
On the following day even less in amount and of lower specific
gravity. In the first day's urine there was, according to the Esbach
albuminometer, eleven per cent. of albumen. Microscopic examina-
tion showed that a few casts were present, mostly hyaline, some of
them studded with cells. There was besides in the sediment a num-
ber of cells seemingly from the bladder and renal pelvis. Sugar,
indican, acetone, urobilin, and bile coloring matter were absent; the
phosphates were normal, the chlorides not diminished.

Evidently the case was one of acute glomerulo-nephritis, the eti-
ology of which had been the attack of purpura hæmorrhagica some
weeks before. The connection between the two diseases is not an
unusual one. Gradually, under rest in bed and suitable diet, with
mild diuretics, the amount of albumen diminished, while the amount
of urine increased and her other symptoms slowly disappeared. In
August, 1896, just about a month after her admission to the hospital,
she left practically well. Her history so far is only of interest as
showing the basis on which her present illness developed. An abso-
lute etiological connection between her former and her present con-
dition is extremely difficult to demonstrate, but their theoretical rela-
tions, at least, are very interesting.

Now we come to the history taken on her entrance into the hos-
pital four weeks ago.

At the beginning of the winter of 1896–97 she developed a slight

cough which grew worse as spring came on. Expectoration was small in amount and not especially characteristic of serious lung trouble, but night-sweats also were observed. About five weeks ago she was taken one morning with an attack of vomiting without much precedent nausea. She brought up nothing but some greenish-yellow fluid, and almost immediately fell in a faint. She remained for fifteen minutes absolutely unconscious. The closest questioning shows that she knew nothing at all of what went on around her just after her vomiting attack. The patient says that after this attack she noticed certain brown spots on her hands and forehead, and afterwards on her feet and legs. Her mother, however, thinks that she had noticed these spots for some time before. The patient was possessed of a full head of blond hair, but in the last five weeks this has become so dark that she is now a brunette .

She has attacks of vomiting nearly every morning now. She feels nauseated for some time, then brings up some greenish-yellow matter and feels considerably relieved afterwards. She has become very weak, and must constantly remain in bed. Attempts to walk are followed by faintness and vertigo. She suffers at times from rather severe abdominal pains. These are localized in the region of the umbilicus, and show no tendency, as did her former pains, to be referred to the lateral abdominal or sacral regions. She has lost her appetite almost completely, and her former diarrhœic condition is replaced by constipation. She now has one stool in two or three days, and that is hard and scanty. She has grown very thin in these last five weeks, as might be expected from the small amount of nutriment that she takes. She suffers from headache, which is mainly localized to the forehead and temple, and is rather a feeling of painful pressure than neuralgic throbbing. She suffers from vertigo at times and annoying ringing in the ears; she has flashes of light before her eyes.

She herself does not think that she has changed any in disposition since the beginning of her sickness, but her mother assures us that the change of disposition is easily noticeable. She has become moody, capricious, and irritable, she weeps easily, and is very sleepy. She is now past seventeen years of age, but she has not yet had her menses. Gynæcological examination by Professor Chrobak shows that her uterus is hypoplastic.

Special examinations of her eye-grounds, of her ears, and of her throat show no abnormalities. Her lungs and heart are normal.

Blood examination gives 5,200,000 red blood-corpuscles and 6000 leucocytes. Her hæmoglobin, according to Fleischl, is seventy per cent. Her color-index is 0.7. In unstained preparations there are no noteworthy abnormalities in the size or shape of the erythrocytes. The blood-platelets are normal in number and appearance and the fibrin net-work is also normal. No abnormal pigment is to be observed, either intra- or extracellular. In the stained preparations there are some distinct differences in the way the red blood-corpuscles take the stain. The leucocytes present are mainly polynuclear. Eosinophiles are present in normal numbers. The blood-pressure as taken in the right radial is equal to one hundred and sixty millimetres of mercury.

Such is the clinical history and the symptomatic picture of the patient whose condition we must discuss to-day in order to differentiate her affection from a number of symptom combinations which more or less resemble it.

The most striking thing about her personal appearance, which is that of a comparatively well-nourished and reasonably well-developed girl of seventeen, are the patches of yellowish-brown color on her forehead and the backs of her hands. When we remember that from a blonde she has in five weeks become a brunette, we realize that this abnormal pigmentation must be an important symptom of her disease. There are no spots on her conjunctivæ, but there are a number on the edges of her tongue and on the mucous membrane of her lips, of the roof of her mouth, of her gums and cheeks, and several deeply pigmented spots in her nose. These patches of yellowish-brown color occur on her feet and legs, too. Here they occur in streaks, and a favorite location seems to be along lines where there had been irritation from the pressure of her shoes.

This melanodermia at once suggests the possibility of Addison's disease, but discoloration of the skin is a polymorphous symptom, and has its origin in a number of very different affections. There is a diffuse pigmentation of the skin that occurs in carcinomatosis, but this is usually ashy gray in color and is not spotty as here; besides, of course, the age of the patient and the course of the disease at once preclude the idea of cancer being a factor in the case. Malaria also causes a diffuse pigmentation, but the patient has never lived in a malarial district, and has never had the characteristic attacks.

Chronic arsenical poisoning gives rise to pigmentation of the skin

which often resembles very closely the discoloration produced by Addison's disease. The favorite locations and the distribution of the pigment are very much the same in both cases, though in arsenic-poisoning the mucous membranes are often not affected. Close study has shown that the same histological conditions may be found in both affections. There is a deposit of pigment granules in the papillary layer of the skin and in the rete cells, which occupy the interpapillary regions. This pigmentation has a special tendency to collect around the blood-vessels. There is even in arsenic-poisoning the occurrence of pigment granules in the peripheral lymph-glands, which is also characteristic of Addison's disease, and which is probably due in both affections to nature's attempt to reabsorb the pigment after its deposition. It is probable, too, that the etiology of the pigmentation in both cases is the same, for we know arsenic therapeutically is a drug with toxic properties for the sympathetics and with a tendency to paralyze the endings of the splanchnics, a state of affairs which obtains, so far as we know up to the present, in cases of Addison's disease.

There are other toxic conditions which produce pigmentation of the skin more or less resembling the pigmentation of Addison's disease. Notably is this the case with silver, and argyria is all the more deceptive, as in it there is discoloration of the visible mucous membranes also. The differentiation is often very difficult, and in a case that I had some years ago in the Rudolf Hospital the surest sign that argyria was the cause of the pigmentation was the presence of silver in the urine. The microscopic examination of a section of the skin or the demonstration of silver in the urine in such a case is usually not difficult, and either is absolutely decisive. In most cases the patient's history and the presence of some chronic digestive or nervous disturbance for which silver has been used as a remedy for a long time clears up the diagnosis. Careful questioning enables us to exclude in our case the toxic influence of either arsenic or silver.

It has been suggested that the bronze diabetes (*diabète bronzé*), described by French authors, might also be a toxic pigmentation. Here there is an intense bronze discoloration of the skin, though the mucous membranes are usually spared. It is probable, however, that the diabetes in these cases is due to some pathological change in the pancreas, and that this pathological condition has led to interference with the splanchnics, and through them with the suprarenal

capsules. A true though secondary Addison's disease would thus be produced, and such cases of functional interference with the nervous mechanism of the suprarenal capsules from tumors, enlarged glands, etc., pressing on the splanchnics and producing Addison's disease, are not extremely rare.

Another pigmentation of the skin that is seen particularly in certain countries, and is also undoubtedly toxic in origin, occurs in the disease known as pellagra. The clinical picture resembles Addison's disease very closely, as I had the opportunity of demonstrating in a study of the disease some years ago. Not, of course, the erythematous form of the disease is referred to, but the chronic pigmentary form. The severe constitutional symptoms produced by the toxins of the "ergotized maize," when combined with the skin discoloration, the favorite seats of which are exactly those of Addison's disease, make the two affections extremely hard to differentiate. As pellagra usually occurs among the Italians, whose congenital cutaneous pigmentation is often very marked, and in whom chronic malaria may also have had its influence in producing discoloration, the pigmentary feature of the disease has sometimes been called into question. But in an epidemic of pellagra among the Csangos of Hungary and Roumania some years ago,—a people strikingly blond in appearance, —I had occasion to notice the characteristic and marked pigmentation produced by it. Here we may exclude pellagra completely, as our young patient denies ever having eaten polenta or bread made of maize.

Had we a history that pointed to the possibility of intoxication with ergotized maize, it would be practically impossible from the pigmentation to make any exclusion, for these spots on the backs of the hands and the dorsa of the feet, on the face and the mucous membranes, are just such as would occur in both diseases. In fact, the specific immediate etiology of the discoloration, as is also the case in arsenic melanosis, is the influence of toxins on the sympathetics, the disturbance of the vasodilator and vasoconstrictor nervous mechanism in the sympathetic, leading to a production of pigment from the blood-pigment in the neighborhood of the affected arterioles where the circulation is interfered with.

Other and less frequent forms of cutaneous pigmentation must also be excluded. Melanosarcoma of the skin may be so diffuse as to simulate Addison's disease, to some degree at least. A case of Dr.

Bamberger's at the Rudolf Hospital some time ago was especially noteworthy as the accompanying constitutional symptoms from visceral metastases, and the diffuse pigmentation at once suggested Addison's disease.   The glandular involvement and the black reaction of iron chloride, when added to the dark-colored urine, were the differential diagnostic points that decided the question.

It must not be forgotten, too, that a certain number of cases of Basedow's disease, with cutaneous pigmentation, have been reported, and the presence of any of the classical symptoms of that disease should be a cause for suspicion.   Pseudoleukæmia, too, has been known to give quite diffuse pigmentation.   In fact, some years ago, in an extremely puzzling case in which most of the important causes for cutaneous pigmentation were suggested by the patient's history, my diagnosis was pseudoleukæmia.   The case was that of an Italian of extremely dark complexion, so much so that he had been known familiarly from earliest childhood as "the gypsy," who had a history of malaria, for which, when quinine failed in its effect, he had been given arsenic in considerable amounts and for a good while.   He was a jeweller, and so had to do with silver.   The differential diagnosis had to be made from congenital pigmentation, malarial cachexia, argyria, arsenical melanosis, Addison's disease, and pseudoleukæmia. The course of the disease, the general condition of the patient, and the presence of enlarged glands led me to decide in favor of the last. Whether the diagnosis was correct or not, I never had the chance to be assured, as the patient left the wards somewhat improved in health after some weeks, and has not turned up again since.

Besides the serious pathological conditions considered so far, there are in women certain functional or reflex conditions connected with affections of the genital organs which cause discoloration and must be remembered.   Here the age of the patient would help us to exclude these, though we have besides, as the result of careful gynæcological examination, nothing abnormal except hypoplasia of the sexual organs.

I have dwelt so long on the differential diagnosis of cutaneous and mucous pigmentation when there is a question of Addison's disease, because, after all, it is the cardinal symptom in the recognition of the disease.   Not that it is an absolutely essential symptom, for cases have been reported where at the autopsy degeneration of the suprarenals was found, and the clinical symptoms and fatal termina-

tion were due to Addison's disease, but without intercurrent pigmentation of skin and mucous membranes. The pigmentation is not even directly due to the suprarenal affection, but to the disturbance of the sympathetic by the degeneration of these glands, there being some not very well understood but intimate nutritional relation between the two.

In the presence of cases of Addison's disease, however, without pigmentation the diagnostician is very liable to be at fault. The adynamia which is really the chief symptom of the disease, the gastro-intestinal symptoms, and a thickening of the arteries for which none of the usual causes can be found (this last symptom I owe to Professor Kollisko, who has often observed it post mortem) may lead us to suspect the presence of Addison's disease, even when pigmentation is absent, but can scarcely enable us to establish a positive diagnosis.

The differential diagnosis of such cases would require us to exclude so many varied and various types of disease that almost the whole field of the clinical diagnosis of internal diseases would have to be gone over. What I wish to insist on to-day is that pigmentation of the skin and mucous membranes must not be allowed too easily to raise the suspicion of the presence of Addison's disease. I have mentioned a good many conditions in which it may occur and have at least some of the characteristics of the symptom as we see it when there is really a suprarenal affection present, yet I have not mentioned them all. I might have added atypical icterus, which has more than once led to mistaken diagnoses, even in recent years, and that rare disease scleroderma.

Besides, pigmentation of skin and mucous membranes occur in otherwise perfectly healthy individuals. Professor Nothnagel has reported one such case where the only pathological condition was simple hypertrophy of the heart.

Once given the skin discoloration as a basis, however, there are a number of symptoms that enable us to make the diagnosis with assurance. Many of them are quite characteristic of the disease, and we have in our young patient most of the additional symptoms typically developed. One of the earliest and the most important is adynamia or asthenia, which may occur without any marked atrophy of muscles. Our patient has, according to the history, grown a great deal thinner, but she is not, as you can see, strikingly

emaciated. Her muscles are scarcely more flabby than might be expected in a rather delicate girl, and seem perfectly capable of supporting her. Notwithstanding that, she is utterly unable to walk about. This abasia is partly due to the fact that when on her feet she suffers from vertigo and faintness, but the important factor in it is the failure of her limbs to support her from weakness.

In connection with her weakness may be noted her tendency to night-sweats and to cold sweats during the day,—symptoms of her disturbed vasoconstrictor and vasodilator nervous mechanism. Her other nervous symptoms include headache localized to vertex and occiput, and described as dull and pressing. It is one of the characteristic forms of headache in Addison's disease, though not the most frequent, and a number of special forms have been observed. Patients are usually either sleepless or intensely sleepy. It is the lethargic form we have in this case, and she sleeps well at night and most of the day. In the sleepless form jactitation is almost incessant, and patients become extremely moody and irritable. While the patient herself denies having become irritable, in the last few weeks her mother finds a great change in her disposition, and especially notices her tendency to weep without cause. Such changes of disposition are characteristic of the disease.

The gastro-intestinal symptoms in our case are quite typically characteristic. She vomits frequently, and the vomited matter is either alimentary in character or is composed of bile and mucus,— the so-called "drinker's vomit." Her appetite is almost entirely gone. Her diarrhœa of years has given place to constipation, with stools not oftener than every three days. Constipation is very characteristic of Addison's disease, and constitutes one of the best differential diagnostic signs where there is a question of pellagra. Pellagra is almost invariably accompanied by diarrhœa. The constipation of Addison's disease must not be treated too vigorously, as I have seen the administration of drastic purgatives followed by unappeasable diarrhœa. Her gastro-intestinal symptoms are completed by the presence of pain generally in the umbilical region. She has had no pain in the sacral region, where, besides around the umbilicus, pain is not infrequently located in Addison's disease; but you may recall that in her sickness last year there was complaint of pain there, and one might think of the beginning of the suprarenal affection at that time. The pain in the sacral region was much more pronounced

than it usually is in simple acute nephritis, and the thought forces itself on one that the cause at work in the kidneys may also have given rise to a pathological condition in the suprarenal capsules. The purpura hæmorrhagica may have given rise to a hemorrhage into the substance of the suprarenals, and so occasioned the typical sacral pain. Such a hemorrhage is sometimes, but not always or necessarily, fatal. The presence of the consequent hæmatoma may have caused the degeneration of the suprarenals which now gives us the symptoms of Addison's disease. Or we might think that the inflammation of the kidney had been accompanied by a perinephritis which had affected the suprarenals, making them a *locus minoris resistentiæ*, and infection with tubercle bacilli had followed.

Another bit of theory may not be so plausible, yet it seems worth mentioning here. The suprarenals may have been congenitally weaker or have been chronically infected before her attack last year, and some of their function supplied by portions of suprarenal tissue existing anomalously in the midst of true renal tissue. The frequency of this anomaly we are now in a condition to appreciate, as careful autopsies have of late made it more and more evident. This supplementary suprarenal tissue may have been affected by her nephritis, and as her suprarenals are unable to fulfil all the functions now required of them, the symptoms of Addison's disease develop.

That we have a very typical case of Addison's disease to deal with is clear. There is the skin discoloration, the feeling of intense weakness, typical gastro-intestinal symptoms, the lethargy, and change of disposition. We have, besides, in the pulse confirmatory symptoms. While the peripheral pulse is extremely weak, there is strong pulsation of the aorta. The intoxication has lessened blood-pressure peripherally, but paresis of the splanchnics has lessened the tone in the aortic walls, and so allows the beating to become not only easily palpable but visible.

The prognosis of Addison's disease is, of course, absolutely unfavorable. The autopsy will probably show degeneration of the suprarenals or some affection of the important nerves leading to them. This may be in the splanchnics, but a recent case reported from Innspruck shows that it may at times be in the central nervous system. In this case a gumma in the spinal cord, probably situated in an important centre, was the anatomical find to account for typical Addison's disease. In another recent case there was caries of the

vertebræ, with consequent spondylitis. Here, too, we must conclude that an important nerve-centre for the suprarenals was disturbed. In this way we are able best to account for the cases of Addison's disease that have been reported without affection of the suprarenals, and the etiologic unity of the disease is becoming more certain.

As to the treatment, not much can be said. Symptomatic treatment for the relief of the more troublesome symptoms must be tried, for the sake of the patient's comfort. Only a modicum of success, however, comes to the best efforts in this direction. I have already warned you to be careful of drastic treatment of the constipation. As to treatment of the suprarenal affection itself, very little can be done. As the degeneration of the suprarenals has in some cases been due to syphilis, antisyphilitic treatment should be tried, especially in cases where there is a history of that disease. Where there is reason to suspect that enlarged tuberculous or lymphomatous glands are pressing upon the splanchnics and causing the Addisonian symptoms by interference with the trophic influence of these nerves, the resolvent effect of intravenous injections of arsenic may be tried.

Organotherapy, which in the light of recent discoveries would seem rational enough, has been tried, especially by the French. It is too soon yet to decide whether it has been of any real use or not. Owing to the easy liability to decomposition of the suprarenal extract, the subcutaneous or even intravenous injection in severe cases seems more commendable than by the mouth. These methods of administration will be given a thorough trial in the case and the results reported to you.

PRACTICAL POINTS IN THE DIAGNOSIS OF INHERITED SYPHILIS IN INFANCY AND EARLIEST CHILDHOOD.

CLINICAL LECTURE DELIVERED AT THE LONDON HOSPITAL.

BY ARTHUR ERNEST SANSOM, M.D., F.R.C.P.,

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GENTLEMEN,—How to determine whether or not an infant is syphilitic is the problem before us.

It is possible that your attention may be called to an infected infant within the first fortnight after its birth. In such case the signs will probably be unmistakable. The newly born child has the aspect of a little old man. The skin of the face is furrowed, and the body greatly emaciated; a brownish-yellow discharge comes from the nostrils; the infant snuffles, and cries with a peculiar hoarse cry. On the soles of the feet, or palms of the hands, you may see large bullæ containing blood-stained serum, sometimes of a greenish hue. These are the bullæ of syphilitic pemphigus; their envelopes may burst, laying bare large excoriations, or their contents may dry to a brownish crust which becomes detached subsequently. An additional crop of like bullæ may be observed over a large part of the surface of the body, but further phenomena seldom become manifest, because the child dies, overpowered by the syphilitic poison.

Cases of syphilis manifested thus early are rare. Much more commonly the infant born at term looks fairly nourished, and presents no morbid signs. It is to an infant between the ages of fourteen days and twelve months that your attention will probably be called, the disease commencing its evolution generally after the first fortnight and before the fourth month of life.

Your advice will probably be sought because the child snuffles, because it is fretful and frequently cries, because a crop of spots is

seen over certain parts of its body, or because it does not thrive, but wastes.

Having ascertained the date at which symptoms first began, and the general history of the phenomena so far as you can obtain it from those who have had the infant under observation, you proceed to make a careful inspection.

You will probably observe that the infant presents signs of marked *anæmia*. The lips and mucous membrane generally are pallid; the surface of the skin is of pale-yellow or pale-brown color. The hue is not clear, the skin seems dirty; sometimes it is œdematous. The anæmia induced by the syphilitic taint is very profound. We have found, in a case which nevertheless improved under treatment, the red blood-corpuscles reduced to twenty-one and a half per cent. of the normal, the white elements being in excess,—viz., about three times the normal proportion in regard to the red.

You will probably obtain evidence that the nasal passages are obstructed. At first the mother thinks that the child has merely a cold; no sooner does she attempt to give the breast than a snuffling snoring noise indicates the obstruction of the nostrils, and the infant, unable to breathe, relinquishes the nipple and becomes fretful. To obtain a sufficiency the process has to be renewed again and again. A viscid secretion may be seen to come from the nostrils, sometimes transparent, sometimes mixed with blood or pus. This may harden within the nostrils to form a yellow crust, and in some cases may obscure a considerable portion of the upper lip. The blocking up of the nasal cavities is a very serious condition, interfering as it does with the due alimentation of the child.

The disease of the mucous membrane may involve the nasal bones so that the bridge of the nose may fall in and the member assume a flat appearance. This deformity may occur at a very early age; for instance, in one of my cases coryza commencing soon after birth was attended by gradual falling in of the bones, till, at the age of three months, there was complete flattening. The disappearance, therefore, of the nasal bones, whatever the age of the child, you observe is an important piece of evidence that there is or has been syphilis.

Very probably you will see a condition of the mouth which is popularly termed "the thrush," as it is rare that a case of infantile syphilis is met with in which, at some time or other, this affection has not been observed. When we come to examine into the matter,

however, we find that what is thus designated "the thrush" is not necessarily the product of the cryptogamic growth, the "oidium albicans," which occurs in the case of the infant free from syphilis. It is true that the oidium develops in syphilitic children, but in the case of syphilis other affections of the mucous membrane complicate its presence. In observing the angles of the mouth of the infant you may find a white patch which may extend from the mucous membrane downward upon the skin; this may be cracked and furrowed below it, and covered with a yellowish-brown crust. On everting the lip you may see the white patch extending over the mucous membrane of the mouth. Other patches may be seen over other parts of the buccal mucous membrane, or the arch of the fauces. These white mucous patches are thickenings of the mucous membrane, with ulcerations of the superficial portions, and they are a part of the group which is designated "thrush." You may find, perhaps, similar white patches about the anus, and behind the ears or between the folds of the groin. Small white streaks followed by cracks in the mucous membrane are often seen upon the tongue. With these special affections of the mouth not only oidium growths, but also aphthæ may be fixed. So the "thrush" of syphilitic children is really a complex group of affections. The great characteristic is its chronicity; in any case when so-called thrush continues long and resists treatment, a syphilitic taint may be suspected.

In some cases the soft palate may be seen to be ulcerated or perforated, and the ulceration may extend into the substance of the hard palate. I have seen much necrosis of the hard palate with a visible sequestrum in an infant two months old.

You may find the lips of the infant covered with a thin layer of pale-brown exudation; this I have often observed in syphilitic children.

Besides these affections of the skin about the nostrils and behind the ears, you will note whether any others are visible upon the face. A dry scaly eruption may be seen upon the forehead and upon the scalp. If you observe it sufficiently early you will find that the dry scaly stage is preceded by a stage in which the affected portion of the skin is covered by minute vesicles. The disease is, in fact, eczema, the exudation of which soon dries. In some cases the edges of the eyelids are colored, in like manner with the lips, with a light-brown crust. Impetigo may be observed in association with the

eczematous eruption; it differs from impetigo in the non-infected child in that the exudation is less yellow, less honey-like, and more of a dirty brown.

I have said that the general hue of the face is often a dull, pale-yellow color; you must also observe whether it presents maculæ or stains. Often there are patches of a color which Sir Wm. Jenner has aptly compared to that of coffee freely mixed with milk.

Having noted these points, you should now turn your attention to the shape of the infant's head. I would strongly advise you to make it a careful study. You should note whether the cranium shows signs of (1) *want of symmetry*. This may be at once evident, or it may be doubtful. For many years I have made observations in these cases according to a plan first brought to my notice by the late Dr. Langdon Down. A wire, or bar, of soft metal, is adapted by even pressure over the surface of the scalp at right angles to the middle line in the frontal, parietal, and occipital regions; when it has thus taken the outline of the circumference of each hemisphere it is removed with care, so that its figure be not disturbed. It is then placed on a sheet of paper, and an exact outline is traced from it by means of a pencil. One outline being obtained, say in the frontal region, the flexible wire is straightened again, and another procured from the parietal, and so on for as many as may be thought necessary. On inspecting these outlines you will see whether there is a strict similarity between the two hemispheres, or whether they are disproportionate. I was soon convinced that in the cases in which I noticed a marked want of symmetry in the cranium collateral signs showed evidence of syphilis, and I come to look upon such want of symmetry as a valuable sign in regard to diagnosis. I fell, however, into a strange error. I looked upon the hemisphere which showed any bulging as the normal, while the other I thought to be subject to some atrophy on account of arrest of development due to the syphilis. Then came the researches of M. Parrot, of Paris, to which I shall presently allude, and I became convinced that the prominent side of the cranium was the abnormal one, that it presented a convexity or "boss." A slight want of symmetry may be observed in cases which are not syphilitic, but when such is decidedly marked it is usually due to an overgrowth of bone distinctly associated with the syphilitic cachexia, and is therefore a diagnostic sign of syphilis. It may be, however, that the cranium manifests not so much want of

symmetry as (2) a *decided peculiarity.* The bosses which I have mentioned may not be especially prominent on one hemisphere, but may be disposed around the anterior fontanelle, two being over the frontal bone in front of the fontanelle, and two behind it over the parietals. There are thus four eminences separated by two furrows crossing each other. Such appearance resembling the contour of the organs in the perineum, M. Parrot called the cranium that exhibited it the *natiform* skull. In some cases only two of such eminences are visible either in the frontal or in the parietal situation. In other cases I have found the characteristic bosses to be absent, but the cranium to present a longitudinal furrow bounded by oval eminences apparently symmetrical. I have called this form the *grooved skull;* it has the same pathological significance as the others.

Another point which I consider to be of importance for diagnosis is the observation of (3) *irregularity of the borders of the anterior fontanelle.* When this fontanelle is to any considerable degree open I have found that in syphilitic cases it often presents certain peculiarities. The free edges of the bones are not, as in cases of rickets, yielding to the pressure of the finger, but are hard and firm. Moreover, they are irregular, one of the borders may differ from another or from the rest; the outline of one or more may be felt to be rough or nodular. I hold this to be a very important distinguishing mark of syphilis. Another phenomenon which may be observed in cases of syphilis, much more rare, however, than the others I have mentioned, is (4) *local softening or perforation of the cranial bones.* On passing your finger over the posterior part of the cranium, usually the occipital bone, you may come upon one or two soft spots. Thinned bone may yield to the finger as if it were a card, or the bone over a circular or an oval spot may be absent altogether. This is the condition described by Elsässer as cranio-tabes, and supposed by him to be associated only with rickets. There can be no doubt, however, that it is to be met with in syphilis, and it is thought by many to be peculiar to this disease. M. Parrot considers that the thinnings or perforations of the bone are due, partly to a syphilitic disease of the bones, whereby they are rendered soft or spongy, and partly to the pressure to which the occiput is necessarily subjected by the pillow upon which it rests for such long periods.

From my own experience I incline entirely to agree thus far with the conclusion of the late M. Parrot,—that whenever you observe

distinct bosses on the cranium having the characters before men-
tioned, and whenever there is localized softening of the cranial bones,
you may conclude that the infant is the subject of hereditary syphilis.

You will now proceed to examine other parts of the body. It
may be that you are informed that the child cries, and gives evidence
of pain whenever it is moved. Or it may be observed that one of the
limbs is motionless; it falls as an inert mass if you lift it and let it go.

In all cases make a careful examination of the rest of the osseous
system, as you have of the bones of the head. Clasping the thigh or
the upper arm, draw downward the hand that encircles the limb; as
you approach the knee or the elbow you may be sensible of a distinct
thickening, which is most evident at the junction of the shaft and the
epiphysis. This thickening does not involve the ends of the long
bones symmetrically and generally as rickets, but often affects many
unequally. The femur, the humerus, the tibia, the ulna and the
radius, the fibula, the ribs, the ileum, the scapula, the clavicle, and
the bones of the hand and foot may any or all be affected. In some
cases paralysis of a limb is due to syphilitic disease affecting the
nervous mechanism, but in the case of complete flaccidity of a limb
it is a pseudo-paralysis due to the fact that syphilitic disease of the
bone has induced such softening that the shaft is separated from the
epiphysis.

You may now turn your attention to the abdomen. Palpation
and percussion may indicate that there is enlargement of the liver
or of the spleen, or of both these organs. The latter, in infantile
syphilis, manifests the most marked increase in size. I have ob-
served it so much enlarged as to occupy the whole of the left hypo-
gastric, umbilical and iliac regions, dipping beneath Poupart's liga-
ment, and encroaching considerably to the right of the mesial line;
and yet, under treatment, it has receded to the normal limits, and the
infant has made a perfect recovery.

In all cases make a careful inspection of the *perineum*, for here
you will find the most constant of all signs. The verge of the anus
may present mucous patches, which extend upward upon the mucous
membrane and outward upon the skin; these may be thin and of
a milky appearance, or may be thick with exuberant growth. I have
said that like patches may be seen within the mouth, and upon the
skin where this is moist, or behind the ears; you may also find such
patches in the folds of the groins. Here the skin appears sodden,

and may present cracks and erosions. When the mucous patches at the margin of the anus have become healed they leave for a long time characteristic puckerings and furrows, to which I attach great importance for diagnostic purposes. A puckered anus is, in my opinion, a very important piece of evidence that the infant manifesting it has suffered from syphilis.

The eruptions which you observe above the perineum of syphilitic children may be multiform. I have said that erythema and erosions are frequent in cases of wasting disease independently of syphilis; but when you observe that pronounced erythema and eczema are very chronic, and especially when they are mingled with other forms of skin-disease, there is a great probability that you have to deal with a syphilitic child. Eczema in these cases frequently attacks the scrotum, and is accompanied by a yellowish-brown impetiginous crust. Ecthyma buttons of a violet or purple color, in various stages of suppuration, may be observed upon the thigh or abdomen. In some cases, defined, hard, oval, or circular masses are felt just under the skin, which run a very chronic course. Sometimes they disappear altogether, the skin above them presenting no alteration. At others they present over the surface covering them a purplish or violet color, and the skin becomes thinner and thinner, till a purulent fluid escapes. These have been termed "gummata" by some observers.

Reinecker described them as "syphilis cutanea nodosa." My late colleague, Dr. Woodman, considered that there was no more certain mark of inherited syphilis than these, occurring as they did in cases with the clearest history of parental syphilis on both sides. The following is his description of them: "The typical gumma is soft in the centre, slightly raised, and more or less flattened; in other words, less accuminated than a boil, and surrounded by a well-defined ring of induration, so that the whole much resembles a wooden ring covered with wash-leather. In its earlier stages the skin is often not at all discolored; afterwards it commonly has a purplish color, with less of a bright or 'angry' red than is common to boils. There is thus a strong resemblance to a button, and hence the French name of 'boutons' which is given to gummata. The true gumma is seldom deeper than the subcutaneous areolar tissue, and can therefore be freely moved over the subjacent muscles. This character is, of course, not diagnostic. Its contents, as indicated by the name, are

of a gummy, glutinous nature, like a solution of gum acacia, and, like that, they may be very thin, or very thick and tenacious, but they are rarely or never true pus. Even when they are said to 'suppurate,' the so-called 'pus' is badly formed, shreddy, thin, and mixed with blood. When two or more of these gummata are closely adjacent or coalesce, the figure is, of course, less circular; and the induration surrounding them may be of a dumb-bell or figure-of-eight form, or elliptical; or like three O O O's thus arranged. A very favorite situation is the fleshy part of the buttocks; the inner side of the thighs and the forearms are other common sites. But when solitary, they not seldom come in the cheek, on the shoulder, in the neck, or on the dorsum of the foot or of the hand. They are often solitary, but when multiple will commonly be found all on one limb, or on one half of the body, like tertiary ulcers. I have met with them as early as five weeks, but they are more common after the first dentition and before puberty."

It is important that you should notice the condition of the skin of the soles of the feet and palms of the hands. These may appear to be very dry, casting off fluffy epithelial scales. Occasionally the desquamation is much more extensive, especially in the case of the soles of the feet; the superficial part of the integument may be lifted *en masse*, exposing a red and shining surface. A red and glazed appearance of the soles of the feet is an important sign of syphilis.

After this general inspection one or two points may remain to be looked into more closely; of these I will only advert to the appearance of the eyes and of the teeth. You may observe that the cornea (especially in the children beyond the age of infancy) present a slight opacity, with a grayish or bluish coloration, more pronounced here and there, so that a mottled appearance is manifest when the cornea is viewed under an oblique light. This is a condition of interstitial corneitis (keratitis) cited by Mr. Jonathan Hutchinson as an important sign of hereditary syphilis.

In children old enough to have commenced to cut their permanent teeth, such teeth, in the subjects of hereditary syphilis, may have special characteristics.

The upper incisors are imperfectly developed; they appear like pegs with a notch at their free border, and they are dwarfed in all their dimensions. In some cases the notch is wanting, and the tooth presents, as Mr. Hutchinson has described it, the screw-driver form.

As a consequence of the dwarfing the teeth are separated from each other by a much wider interval than under conditions of health.

Having obtained the important evidence which is given by a careful inspection of the child, you may proceed to make inquiries as to the probable mode of infection. Then inquiries may be *oblique* or *direct*. Among *oblique* inquiries come these: Has the mother had any miscarriages, and, if so, how many? Syphilis is so frequent a cause of abortion that when there is a history of several miscarriages it may be suspected that the mother has been infected; the evidence, however, should by no means be regarded as conclusive; other signs of corroboration must be sought. The oblique form of interrogation may elicit that there has been some ulceration of the cervix uteri, some prolonged leucorrhœa; perhaps a record is given of a course of mercurial treatment; all this may point to the probability of primary syphilitic infection. Or there may be a distinct evidence of secondary symptoms on the part of the mother, ulceration of throat or palate, skin affections, iritis, periostitis, nodes, etc.

The prosecution of *direct* inquiry as to the infection of either of the parents of the child is a matter of much delicacy. To put the plain question may be to mar the peace of a family. On the other hand, it may be asked, What right have you to infer syphilis in the child when you have no direct evidence of infection through the parents or otherwise?

It is often urged against particular physicians that they are too prone to see syphilis in the cases which they have to treat. What is the answer to those who demur to the diagnosis? It is that in a certain proportion of cases direct evidence is obtainable from the voluntary confession of the parent, and that in the rest the resemblance of symptoms is so close to those in the first category that an identity of cause is indicated with the highest probability. Moreover, in many of the cases wherein direct evidence is not obtained the phenomena of the disease are observed in varying "nuances" and gradations in successive infants born of the same mother.

My late colleague, Dr. Bathurst Woodman, based an investigation of the relative frequency and value of certain symptoms of inherited syphilis upon two hundred cases of children, in all of whom one parent was known to have suffered severely from syphilis, and in all but four or five there was evidence that both parents had so suffered. The following table indicates the symptoms observed:

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TABLE OF DISEASES IN TWO HUNDRED CASES OF CONGENITAL SYPHILIS.[1]

Diseases.	No. in 200 Cases.	Per cent.
Thrush	131	65.5
Snuffles	108	54.0
Gummata	84	42.0
Specific skin-diseases	71	85.5
Genitals	59	29.5
Glossitis and gingivitis	45	22.5
Mucous tubercles	89	19.5
Adenitis	82	16.0
Nodes on long bones	10	5.0
Enlargements, etc., in internal organs	6	8.0
Iritis or corneitis	5	2.5
Notched teeth	5	2.5

The following table, showing the relative frequency of the signs, is deduced from my own observations:

ANALYSIS OF TWO HUNDRED CASES OF CONGENITAL SYPHILIS.

AGED ONE MONTH AND UNDER, TEN CASES.

Eruptions about perineum	All.
Coryza and affections of nasal passages	80 per cent.
Stomatitis and thrush	80 "
Bone lesion	10 "

ONE TO TWO MONTHS, FIFTY-THREE CASES.

Eruptions about perineum	All.
Coryza and affections of nasal passages	54 per cent.
Stomatitis and thrush	18 "
Eruptions on face and other parts of the body	18 "
Diarrhœa	15 "
Cranial lesions	7½ "
Epileptoid convulsions	7½ "

TWO TO THREE MONTHS, FORTY-TWO CASES.

Eruptions about perineum	All.
Eruptions on other parts of the body	60 per cent.
Coryza and affections of nasal passages	50 "
Stomatitis and thrush	45 "
Diarrhœa	19 "
Cranial and bone lesions	5 "
Epileptoid convulsions	9½ "

[1] "On the Relative Frequency and Value of Certain Symptoms of Congenital Syphilis," by Bathurst Woodman, M.D. Transactions of the St. Andrew's Medical Graduates' Association, 1874.

THREE TO FOUR MONTHS, TWENTY-ONE CASES.

Eruptions about perineum . . . . 80 per cent.
Eruptions on other parts 60   "
Coryza and affections of nasal passages 42   "
Stomatitis and thrush 23   "
Diarrhœa 83   "
Wasting 42   "
Cranial and bone lesions 19   "
Epileptoid convulsions . . . . 4½   "

FOUR TO SIX MONTHS, EIGHTEEN CASES.

Eruptions about perineum . . . . 66 per cent.
Eruptions about other parts 61   "
Coryza and affection of nasal passages 38   "
Stomatitis and thrush 83   "
Diarrhœa 11   "
Wasting 25   "
Cranial and bone lesions 15   "
Epilepsy and cerebral affections 15   "

SIX TO TWELVE MONTHS, THIRTY CASES.

Eruptions about perineum . . . . 63 per cent.
Eruptions about other parts 46   "
Coryza and affections of nasal passages 16   "
Stomatitis, thrush and ulceration of palate 40   "
Diarrhœa 20   "
Cranial and bone lesions 50   "
Epilepsy and paralysis 20   "

ABOVE ONE YEAR, TWENTY-SIX CASES.

Eruptions about perineum . . . . 83 per cent.
Eruptions about other parts 26   "
Coryza and affections of nasal passages 19   "
Stomatitis and thrush 11   "
Diarrhœa 23   "
Wasting 42   "
Cranial and bone lesions 58   "
Conjoined with signs of rickets 15   "
Visceral affections (liver and spleen) 26   "

THE ASSOCIATION OF PULMONARY TUBERCULO-
SIS AND ARTHRITISM.

CLINICAL LECTURE DELIVERED AT THE PARIS MEDICAL SCHOOL.

BY PROFESSOR LANDOUZY, M.D.,
Professor of Therapeutics in the Faculty of Medicine, Paris, France.

GENTLEMEN,—Ever since the discovery of the bacillus of tubercu-
losis by Koch innumerable researches have been made to determine
the exact nature of its action on the human tissues. While we must
recognize the extreme importance of a thorough knowledge of the
bacillus in order to understand completely the proper management
of a case, nevertheless it is especially important to consider the media
in which the germs are fostered in order to properly carry out the
prophylaxis of tuberculosis. The mistake is sometimes made of
devoting all of one's attention to the character and life history of the
bacillus without attempting to analyze the conditions which are most
favorable to its growth. If the manner in which the system pro-
tects itself against the attacks of the bacillus is not understood, an
important point in the treatment and the prognosis has been omitted.
Let us suppose for example that two individuals are attacked by mi-
crobes of equal virulence, and that the same degree of vitality was
present in these organisms, but that, on the other hand, there was a
noticeable difference in the susceptibility of the two individuals.
The course of the disease in these two cases would be very different.
Thus it may happen that you will be called upon to treat two patients
in the same locality stricken with tuberculosis at the same time. One
of these will exhibit all the pronounced symptoms of the disease and
rapidly progress towards a fatal issue, while the other—under appar-
ently similar surroundings—is able to resist the disease, and although
he may not be permanently cured, he may at least resist the on-
slaughts of the bacillus over a considerable period of time. In such
a case it may be possible perhaps to imprison the microbes, as it were,

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and thus localize the disease.   On the other hand, it is a matter of common experience to find that out of ten individuals exposed to the same contaminating influences two or three will exhibit no signs of disease whatever and seem immune to tuberculosis, while the remaining seven will develop the disease in one form or another.

In certain cases the pulmonary lesion may remain so localized that the infection may be said to be latent, and the bacillus will not be able to completely invade one or both lungs.   In this way a mild infection will result which is very different from those severe cases where both lungs are infiltrated with the bacilli, and large cavities result sometimes to such an extent that the entire pulmonary tissue is almost completely destroyed and death inevitably results.

Patients whom you will be called upon to treat for this affection may be divided into two classes: first, those who are refractory, or immune to the disease, and second, those who are predisposed to it. These terms are, however, purely relative.   When we say that an individual is refractory to tuberculosis, we apply that term to a person in whom the chemical, organic, and functional conditions present a certain reaction opposing the development of the disease.   In a typical example of this class the bacillus may be present in considerable quantity and be very virulent in character, but the mucous membrane of the bronchial tubes offers no favorable media, and it therefore dies because it has not found the conditions which were required for its evolution.

While these patients never develop any pulmonary lesion, we must include among their number a certain group which have been well called arthritics.   By an arthritic is meant an individual who responds to the action of the bacillus in a peculiar and characteristic manner.   Examples of this class have frequently appeared in this clinic, and you will recall that in examining such cases we were never satisfied with simply making an examination of their present condition, but always inquired minutely as to the past history from childhood to adult age, and that we were particularly careful to determine what previous sicknesses the patient had undergone.   Perhaps on questioning such a case you will discover that in infancy while cutting a tooth the patient experienced serious gastro-intestinal disturbance.   Somewhat later in life, perhaps, when attacked by some eruptive fever like measles, for instance, the temperature record may have reached 104° F., or even higher, accompanied by some

delirium. In a word, such a patient will respond much more violently to any infection than one would expect. Take such a case at the age of seven or eight years: after a somewhat longer walk than usual on a cold day he comes into the house a little hoarse, and during the night is wakened by a difficulty in breathing which seems to almost choke him. The parents become alarmed and, fearing that dreadful malady croup, hasten to call a physician, who, after examining the patient, assures them that there is nothing to be alarmed about. He informs them that the child is suffering from an attack of pseudo-croup, or spasm of the glottis, but here again the child has a high fever with a very mild attack, and reacts violently to a mild laryngitis.

Later in life, say, on or about the fifteenth year, such a patient may be a terrible sufferer from attacks of migraine and of marginal erythema, which is usually localized in the upper part of the inner surface of the thighs. If such a patient happens to be a female, you will learn that, in addition to these attacks already described, at the time for the commencement of her menstrual period she suffered considerably, and to such an extent that her physician pronounced the attack one of peritonitis. In this connection let me mention a typical example of cases which you may be frequently called to see, and among whom you might make the mistake of pronouncing an apparently violent attack of graver import than it really was; for example, you are called to see a girl of fifteen years who is suffering from terrible pains in the abdomen accompanied by bilious vomiting. At first glance you fear peritonitis, and if you so inform the parents you might make a serious diagnostic error, as the next morning all the alarming symptoms may have subsided. When you come to question the mother of the girl you will find that her menstrual periods were established the day previous, and her symptoms are thus explained. Subsequently menstruation is attended with less violent symptoms, but such a patient is liable to suffer from neuralgia at these times, and perhaps have an outbreak of pimples on her face, or the menstrual flow is either too scanty or too abundant.

Thus a typical arthritic of either sex will become congested easily, react violently to irritating agents, and is prone to the deposit of fibrous tissue subsequently around any inflammatory focus. For example, a tubercular lesion having formed in one lung, the patient reacts violently, develops passive congestion of the lungs, and per-

haps hæmoptysis, but eventually there is a net-work of fibrous tissue developed around the tubercular nucleus, which becomes completely imprisoned by it. The walling off of the tubercular poison in this way is of the greatest importance to the patient, as the normal pulmonary tissues are thus protected. Furthermore, the streptococcus of caseation is, by the same means, prevented from forming a cavity in this tubercular focus. It is this formation of fibrin, therefore, which prolongs the patient's life and makes it possible for certain cases to actually recover from the disease.

In the treatment of this disease hygienic measures adapted to the particular needs of each individual case are of special importance. The patient should, if possible, live in that climate which is the least apt to aggravate his condition, and his diet should be carefully regulated. The early adoption of prophylactic measures is especially important. The medication of such patients is most unsatisfactory. It is useless to dose them with substances which are recommended for their microbicide properties. If the baneful influence of the microbe can be curtailed or entirely prevented, the best possible good will result, and the ultimate death of the germ will inevitably follow. It is practically impossible to attack the bacillus directly. It is most rational, therefore, to build up the patient's power of resistance to the highest possible point, and endeavor to maintain it at a high level. Bearing these facts in mind, it is not difficult to understand why certain drugs have been wonderfully successful in selected cases. The patients had a strong tendency to spontaneous recovery, and the drugs administered played an insignificant part in each case. Be cautious, therefore, about adopting as a specific any remedy which professional brethren may claim great results from in their ill-timed enthusiasm.

PYOTHORAX; BILHARZIA HÆMATOBIA; ANGINA PECTORIS.

BY WILLIAM H. PORTER, M.D.,

Professor of General Medicine and Pathology; Physician to the Post-Graduate Hospital.

GENTLEMEN,—The first case this morning is a very interesting one of acute empyema. The patient was admitted to my service in the hospital on the 3d of March. The following history was then obtained: For the past eight years he had suffered from recurring attacks of rheumatism, which affected chiefly the feet and ankles. He had two or three attacks yearly. Four weeks ago, or early in February, he was unduly exposed to wet and cold, made necessary by his occupation, that of a horse-car driver. Following the day's exposure, in the evening he was taken with a very severe pain just below the right nipple. This was accompanied by a short, dry cough. The pain and cough grew steadily worse, and in a short time he began to expectorate a white frothy sputum. Since the beginning of the attack he has been confined to his bed. The pain, which was first noticed on the right side, gradually moved to the left over the præcordial region. It moved farther over to the left, becoming less intense, and finally disappeared entirely about one week before he was admitted to the hospital. The cough and expectoration continued, and the dyspnœa became more pronounced. The patient lies by preference on the right side, as in that position he breathes with greater ease. The physician who had him in charge before he was admitted to the hospital explored the left chest cavity with a hypodermic needle, and withdrew pus, thus establishing the diagnosis of empyema.

Upon physical examination at the time of admission, the patient was found to be very poorly nourished, extremely thin, the skin

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bathed in a clammy perspiration. The whole picture was that of a "septic condition," yet no distinct history of recurring chills could be elicited. The respiratory movements were rapid and labored. The heart action was also rapid, as evidenced by the apex pulsation. Palpation gave absence of fremitus on the left side, and exaggerated fremitus upon the right side. On percussion there was marked dulness—in fact, flatness—over the inferior two-thirds of the left thorax, and some dulness over the superior third. Upon the right side the resonance was slightly exaggerated. Upon auscultation there was absolute absence of the respiratory and voice sounds over the inferior two-thirds of the thorax. A few mucous râles were heard above the level of the fluid. The breathing sounds at the apical region were short and rough, almost broncho-vesicular in character. This was due to the compressed condition of the lung at this point. There was exaggerated breathing upon the opposite side. The abdomen was somewhat distended, but otherwise the physical examination revealed no abnormality. The introduction of an aspirating needle at the seventh interspace resulted in the withdrawal of pus. The first sound of the heart was feeble, while the second was somewhat exaggerated. The muscle-tone, however, was fairly good. The pulse was 130, respiration 40, temperature 101.5° F. The urine was scanty, acid, high-colored, and had a specific gravity of 1020. It contained fifteen per cent. of albumen by volume, with hyaline and granular casts.

The patient was placed upon a milk and egg diet. He was also given the simple bitters, and a generally stimulating treatment, such as strychnine, caffeine, and camphor. His bowels were freely opened, and he was given some digestive ferments and intestinal antiseptics to aid his enfeebled digestion. At the end of three days he appeared to be a little improved, and it was then decided to operate upon him with the expectation of withdrawing the pus from the chest cavity. The ribs were so very closely approximated that it was impossible to get a drainage-tube between the two; therefore it was decided to excise a portion of one rib.

The patient was taken to the operating-room on March 6, or three days after admission. Owing to his enfeebled condition, the great obstruction to his breathing-space, and the parenchymatous metamorphosis of his kidneys, the administration of ether was absolutely out of the question. The only anæsthetic that we would have

been justified in using was chloroform, and in my opinion either one would probably have caused death. It was therefore decided to operate under cocaine. The patient was given a full therapeutic dose of morphine hypodermically, and placed on the operating-table.

Careful antiseptic precautions having been instituted, cocaine, two-per-cent. solution, was hypodermically injected into the skin over the region of the eighth rib in the post-axillary region. An aspirating needle was introduced between the seventh and eighth ribs and pus withdrawn. An incision was then made, two inches in length, directly over and parallel to the long axis of the eighth rib. The incision was carried down through the periosteum to the bone. The periosteum was then cut back from the rib, and with the bone-forceps an inch and a half of the eighth rib were removed. Immediately underneath the bone there was found a thick and very vascular layer of tissue, which was originally the pleura. This bled very freely. This thickened membrane was pulled out of the wound and an attempt made to reach the pus cavity through it. The drainage-tube was inserted into and through it, upward and inward into the chest cavity, for four and a half inches. There was a slight discharge of purulent matter, with quite free oozing of blood, but there was not the free discharge of pus that might have been expected from a pleural cavity two-thirds full of pus. An antiseptic dressing and bandage were applied, and the patient was returned to the ward in good condition.

For the next few days there was considerable discharge from the wound, but it was of a sero-sanguineous character rather than of a purely purulent nature. The general condition of the patient steadily improved, yet the physical signs persisted, and it was evident that the pus-cavity was not properly drained. On the 19th a curved trocar was introduced into the wound and passed up into the chest cavity about two inches, thus reaching the pus-cavity. At this time there was a very free discharge of pus, about a quart in all. The opening made by the trocar was enlarged and a drainage-tube inserted. From this time on the improvement in the patient's general condition was uninterrupted. The physical signs of fluid in the chest rapidly disappeared, and the lung slowly expanded to fill the space formerly occupied by the pus. For the first few days the discharge of pus was very abundant, but it has steadily grown less until to-day there is no cavity left into which the shortened drainage-tube

can be inserted. In a few days this small granulating wound will be closed and perfectly healed. This being the 31st of the month, twenty-six days have elapsed since his admission. The urine is now free from albumen and casts, and is nearly normal in every respect. In a few days the patient will be ready to be discharged "cured," which is a pretty good result for so severe a case of empyema in an adult. The result is in a large measure due to the strict attention paid to his diet and the giving of such remedies as tend to enhance the digestion and glandular activity, together with appropriate stimulation.

Regarding the operative side of the case, you are probably all well aware that it is customary to excise the sixth or seventh rib, but no reason is given for selecting a rib so high up, except that the diaphragm may act like a valve and thus close the wound. On the other hand, it is well known that the pleural cavity extends as low down as the tenth rib, or even lower on the left side; therefore, it would be natural to drain at a lower point if the bottom of the pus-cavity were to be reached. The results in this case explain fully why it is necessary to select so high a point if the pus is to be easily reached. The inflammation of the pleura, with its necessary thickening and inflammatory exudate into the pleural cavity, tends to fill up and obliterate entirely this inferior or complemental pleural space, so that the inferior limit of the true pus-cavity, as shown in this case, will be at a level with or above the eighth rib. Therefore, if the eighth rib is excised, as was done in this case, the operator is liable to find himself below the pus-cavity, which will be imperfectly drained, if drained at all. In this particular instance, and with the extremely depressed condition of the patient, it is quite possible that the relief of tension and steady oozing from the chest, which occurred as the result of the excision of the rib, put the patient in a better condition for the complete removal of the pus a little later. He may even have done better than if the pus had been completely removed at the first sitting. This much, however, can be said, the patient has made a complete recovery, and has been an interesting case to follow. It has taught us much in reference to the management of this class of cases that is not to be found in our modern textbooks.

The next case is represented by a sample of urine only, and its microscopic contents. Even if we had the patient before us, we

would have nothing more to see, for all the symptoms and the only symptom is to be found in the urine. I am especially indebted to my colleague, Professor George M. Edebohls, through whom the specimen was obtained, and also to our pathologist and director of the laboratory, Dr. Henry T. Brooks, who examined the specimen for Dr. Edebohls and made the correct diagnosis.

It is, in all probability, the first case of its kind that has ever been recognized in this country, and for that reason the greatest of credit is due to the microscopist for recognizing the true condition. The Post-Graduate School is also fortunate in having such an able pathologist. It is also the first case of its kind to be presented at a clinic in this country.

The history of the case is as follows: J. A. R., rabbi, thirty-two years of age, married. He has spent one year in South Africa, half a year in Port Elizabeth, Cape Colony, and half a year in Kimberly, returning thence to the United States in December, 1894. The journey occupied about six weeks. Three days after his arrival in this country he noticed hæmaturia, and this was continuous up to March 25, 1897, which was the last time he was seen by Dr. Edebohls. He was first seen by Dr. Edebohls on March 20, 1897. At this time he was carefully examined by Dr. Edebohls, and the only abnormality of the genito-urinary tract was a little softness of the posterior wall of the bladder, but there was no evidence of any tumor of any kind. The patient then stated that he had consulted several physicians, but no positive cause for the hæmaturia could be found by any of them. He stated, also, that the great bulk of urine was passed clear, but towards the end of micturition it became bloody and contained a number of larger or smaller coagula, varying in color from yellowish white to blood-red. The specimen passed in the presence of Dr. Edebohls was voided clear, with the exception of a small number of blood-stained coagula and shreds, until the last few drops, which contained much blood. On March 20, about half an hour after the urine had been voided, Dr. Edebohls placed the sample of urine in Dr. Brooks's hands for examination. Dr. Brooks found innumerable isolated and partially decolorized red blood-corpuscles, a large number of pus-cells, occasional hyaline and finely granular casts of small diameter, and a number of small coagula and masses composed chiefly of pus and blood embedded in fibrillated fibrin and mucus. He also found within these coagula, and free in

FIG. 1.
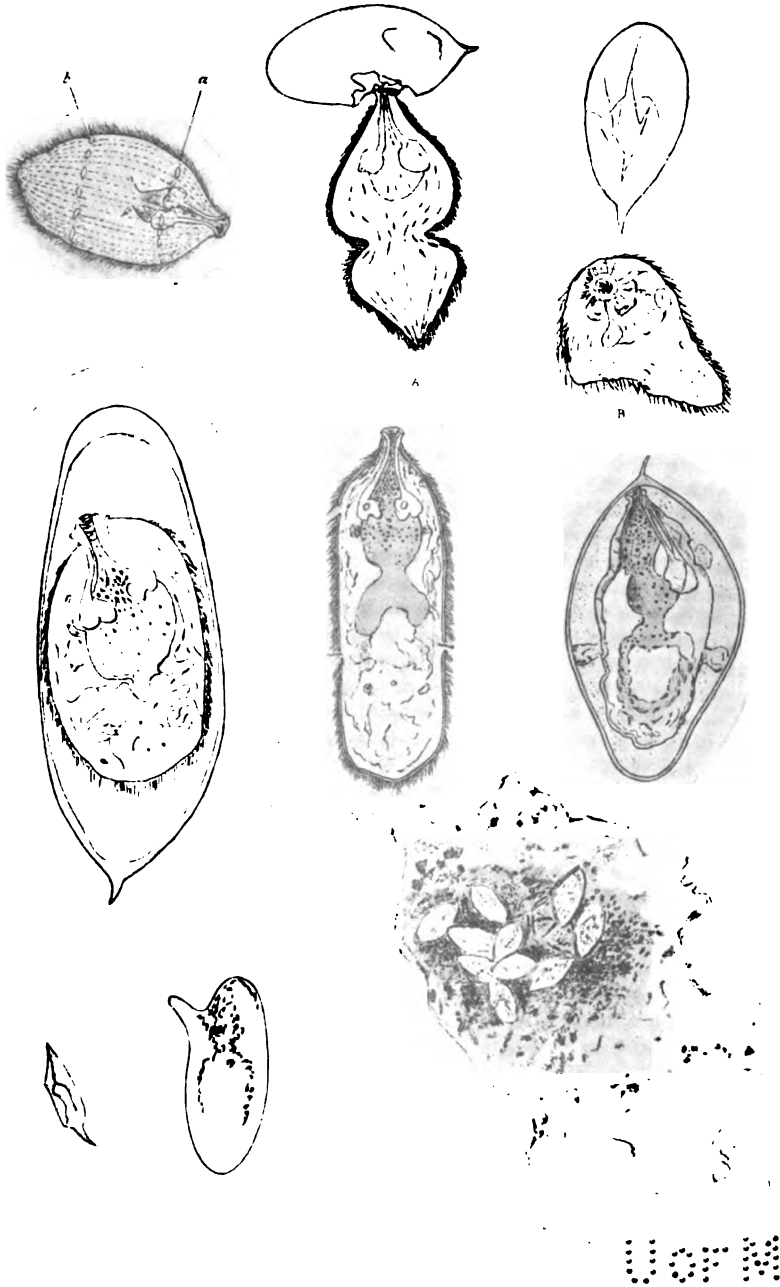
Fig. 2.
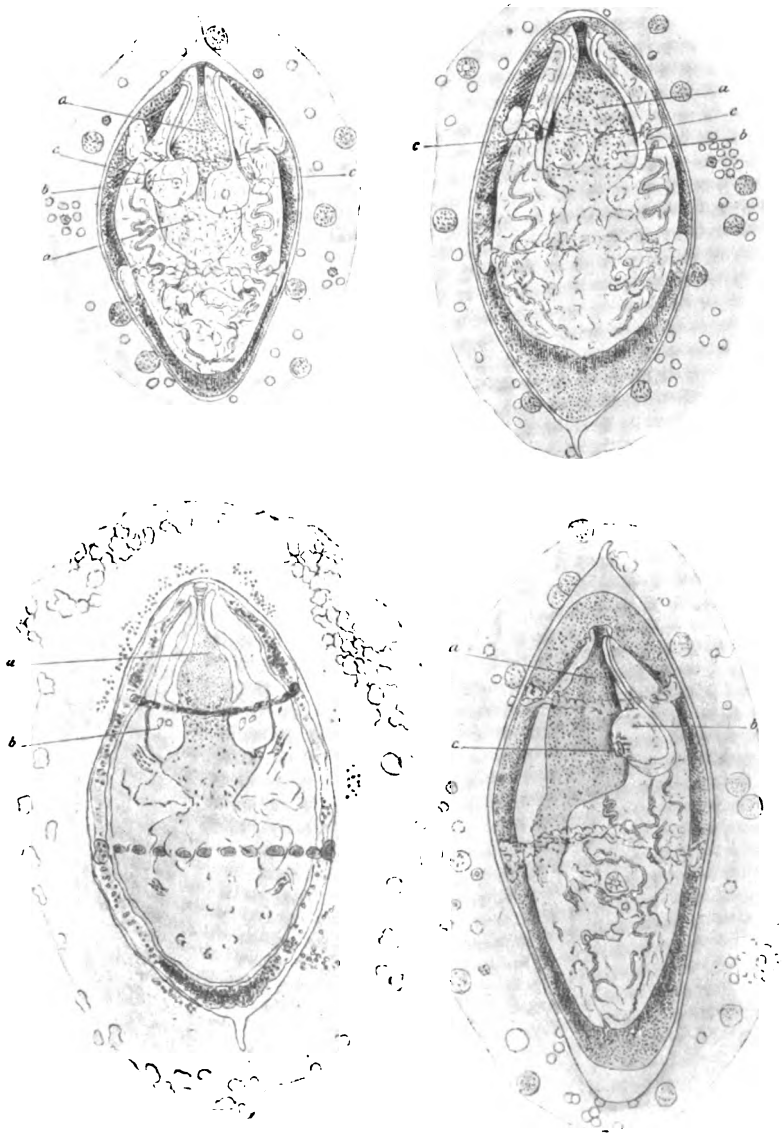
FIG. 3.
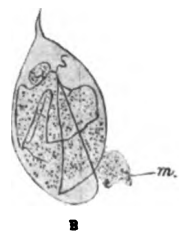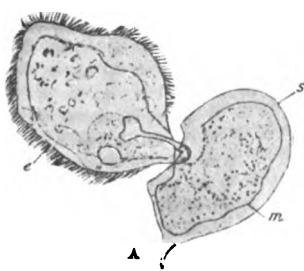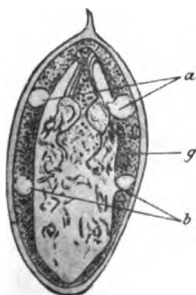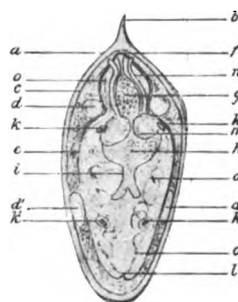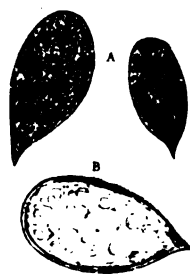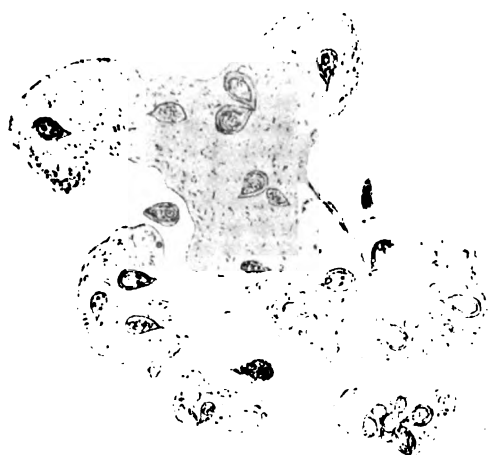
the field of the microscope, a number of large, ovoid bodies, with one end gradually drawn out into a sharp spine, the other bluntly rounded. When Dr. Brooks examined these bodies under a high power, he found that they were composed of a moderately thick, homogeneous structure having a peculiarly arranged glandular apparatus made up of a tortuous duct ending by branches in an irregularly lobulated, opaque, and granular organ. This glandular apparatus was situated in the rounded end of the ovoid body. Dr. Brooks recognized these bodies as the ova of some animal parasite, which by a process of exclusion he finally decided to be that first described by Dr. Bilharz as the *distoma hæmatobia,* or *distomum hæmatobia* of Ziegler and Leuckart, now, perhaps, more generally known as the Bilharzia hæmatobia. To confirm his diagnosis the doctor took a fragment of a coagulum containing some ova and gently crushed it upon a slide, and treated it with plain water under a cover-glass. When this was done, he noticed almost immediately movements of a jerking, contractile character, occurring at irregular intervals within the ova. As the minutes passed, the movements soon became more and more active and violent, until suddenly the envelopes were rent asunder, the embryos escaped, and at once began to swim about freely. The embryo, when freed from its shell, was somewhat ovoid, lobulated, and provided with a button-like knob located upon the cephalic end. The whole external surface was covered with innumerable, actively motile cilia. The swimming movements of the embryo continued under the cover-glass at room temperature for from ten to twenty minutes, after which interval they gradually ceased. The cilia, however, continued their movements for a much longer period, and then, like the embryo which they formerly propelled, slowly came to rest. After the urine had stood for thirty-six hours the ova contained therein no longer gave any evidence of life when treated with water.

Dr. Brooks has very kindly prepared for us a specimen of the ova, which are very distinctly seen here under the microscope. He has also placed a drawing of the same on the black-board, so that you will have no difficulty in recognizing the ova under the microscope. In addition to this we have here these plates (Figs. 1, 2, 3) representing ova and embryo in their various stages of development. These were taken from Dr. George Saunderson Brock's article upon this important subject, published in the *Journal of Pathology and Bac-*

teriology for 1893, vol. ii., Part I., page 52, which is one of the most recent and exhaustive articles published on the Bilharzia hæmatobia. As you are probably all aware, there is very little to be found relative to this parasite in our text-books. Among those published in this country, the work of Dr. Gross upon the "Diseases of the Urinary Organs" contains a short reference to this parasite, and in my own work on "Renal Diseases," published by William Wood & Co., in 1887, the Bilharzia is described in abstract form, and a picture given of the worm, but not of the ova as we see them here under the microscope. This disease is described at some length in works on parasites, such as Cobbold's and Leuckart's. It is described in Thoma's and Ziegler's works on pathology, but not in the ordinary text-books on pathology. Reference to it is also made in the cyclopædias and dictionaries of medicine, such as von Ziemssen's and Wood's "Reference Hand-Book," the "Twentieth Century Practice," Quain, Dunglison, and Gould. So far as I have been able to ascertain, all the articles upon this subject published from time to time since Dr. Bilharzia's recorded discovery, which occurred in 1851, have been by European or English authors.[1] There is the record of one other patient having travelled through the northern part of the United States and Canada for several years, suffering continuously with hæmaturia, but which was not recognized by any of the physicians who saw him in this country as being due to the Bilharzia hæmatobia. After he returned to England, however, the ova were discovered in the urine, and the correct diagnosis made. How many similar cases may have passed through our hands unrecognized cannot be told, nor is it strange that we should overlook the disease while the subject has been given only a passing note in our common text-books. For that reason great credit is due Dr. Brooks, and especially so as he knew nothing of the history of the case at the time the urine was placed in his hands. With the complete history of the case and a hint at what the difficulty might be, it is a simple and easy matter to make the diagnosis.

All that is absolutely known as to its etiology is that the embryos are taken into the alimentary canal in the drinking water. From the alimentary tract they find their way into the veins that take their

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[1] Since this lecture was delivered, Dr. Brooks's article on this case appeared in the New York Medical Record for April 8, 1897, and on May 1, 1897, Dr. F. Sondern published an article in the New York Medical News on the same case.

origin along the line of this canal, but for some as yet unexplained reason they seem by preference to locate in the venous plexuses around or in the mucous membrane of the bladder and rectum. Prevention can be accomplished by boiling all the water that is drunk when living in those regions known to give rise to the disease.

No definite treatment that yields positive results has thus far been discovered. Attention to the diet and general aids to assimilation finally place the system in a position to cope successfully with the parasites in most instances.

This case may be regarded rather as a mere curiosity than as a disease that we shall frequently meet with, yet it is quite possible for such cases to fall into our hands from time to time, and we should be prepared to recognize them if perchance they come to us for diagnosis and treatment. For that reason this case has been presented to you this morning.

The third case before you is one of more common occurrence. It is a case of angina pectoris with the following history: A. S., thirty-nine years of age; native of the United States; a coachman by occupation, who was admitted to my service in the hospital on March 17, 1897. He has had three attacks of gonorrhœa, but without any marked complications. Seven years ago he had his first attack of rheumatism, which at that time affected principally the shoulder-joints. Since then he has suffered from time to time with milder attacks. He had also used alcohol to excess. About one year ago he noticed for the first time that he was suffering from marked dyspnœa upon exertion. With this there was marked pain and a decided sense of oppression in the epigastric and lower sternal regions. For these symptoms he was treated for dyspepsia, but without any relief. A few weeks later he had his first attack of sharp, severe, and agonizing pain over the heart. The pain from the central point radiated down the sternum and into the left arm. These attacks have continued to recur frequently, and for these he has taken a great deal of medicine, until finally he learned to carry and to use one-fiftieth-grain tablets of glonoin. The taking of one of these tablets early in the paroxysm very materially lessens the intensity, but does not prevent their occurrence. Amyl nitrite does not work as effectually. As a result of these attacks he has not been able to do any work for six months. The attacks come on in the night, towards morning, and exertion or overeating, and the use of alco-

holic stimulants is sure to precipitate an attack. The attacks now consist of a sudden flushing of the surface capillaries, profuse perspiration, and a decidedly agonizing expression of the face, but the pain is less intense than it was in the beginning. The heart's action becomes rapid, but without palpitation. The arterial tension is decidedly increased during the paroxysm.

Physical Examination.—On inspection, the so-called apex-beat was found to be diffused over an unusually large area and displaced downward and to the left. There was also noticed marked epigastric pulsation. On percussion, the præcordial area of dulness was decidedly greater than normal, indicating a marked hypertrophy. Upon auscultation, a well-marked direct and an indirect murmur were heard at the base of the heart, over the seat of the aortic valve, the former being heard with greatest intensity at the right of the sternum at the second intercostal space, and from there was transmitted to the right and up and along the course of the great vessels. The latter was heard at the left of the sternum at the third intercostal space, and was transmitted to the left and downward towards the apex, and also directly down the sternum. There was also a marked indirect murmur heard over the apex area, which was transmitted to the left, was lost at the axillary line, and could be heard distinctly posteriorly over the eighth dorsal vertebra and between it and the inferior angle of the left scapula. There is also a slight direct murmur at the mitral orifice that is heard with greatest distinctness just above the so-called apex-beat, or over the junction of the fourth rib and its costal cartilage. This last murmur is the least pronounced of the four, all of which can be easily heard and determined by closely studying the rules of production and directions of transmission, as indicated in this chart. (See Fig. 4.) The lungs were normal. The only abnormality detected below the diaphragm was a slight enlargement of the liver. While the patient has been in the hospital he has had recurring attacks, but has been very much improved by the plan of treatment that we have pursued. In this instance, there is sufficient mechanical defect in the valvular mechanics to decidedly impair the nutritive supply of the heart, thus lowering the nutritive tone and action of the nervous mechanism of the heart, which in turn, in a manner yet to be perfectly explained, produces these spasms and the associate symptoms to which the term "angina pectoris" has been given. At the present time he

is so perfectly under the control of the medicines given that he has very few attacks, and probably will not have an attack before you, as he did the last time he was before us.

Your attention is particularly called to the double murmurs at the base and apex, all of which you can easily detect if you will closely follow my rules for the identification of these cardiac murmurs, as already pointed out to you. The only one that will give you

FIG. 4.
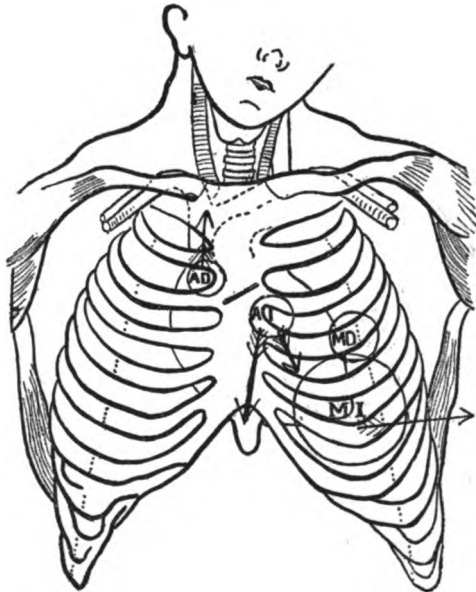
Professor Porter's skeleton scheme, showing position of the heart in the chest cavity; also the areas in which the different murmurs can be heard with greatest intensity. MD, mitral direct, stenotic, or presystolic murmur; MI, mitral indirect, regurgitant, or systolic murmur at the mitral orifice; AD, aortic direct, stenotic, or systolic murmur at the base; AI, aortic indirect, regurgitant, or diastolic murmur.

any trouble to find in this case is the mitral direct murmur. It is not often that we find so many murmurs well defined at the same time; for that reason he is an especially interesting case to study. Not all the cases that we see of angina pectoris have pronounced evidence of lesions that can be detected during life, but in almost all instances, when carefully examined at the necropsy, some small lesion of the blood-vessels or of the muscle substance will be found which has impaired decidedly the nutrition and regular action of the nervous mechanism of the heart and the vessels emanating therefrom.

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Since this patient has been in the hospital he has been kept upon a well-regulated mixed diet, with special attention to his digestion, and also to keeping the bowels moving freely. In this particular instance the belladonna group, even used in the smallest dose, was seen to precipitate a paroxysm. The best results were obtained by the free use of nitroglycerin and a quieting capsule composed of sulphonal, chloralamide, and the extract of damiana, three grains of each at a dose. One of these capsules was given three or four times daily. The result was that he slept well at night, and the paroxysms that had been coming regularly every night ceased to occur. Now he is feeling much better in every respect than he has before since the development of his angina; in fact, it is one of the best results of treatment in my experience with this disease.

CHRONIC INTESTINAL INVAGINATION.

BY HERMANN NOTHNAGEL, M.D.,

Professor of Special Pathology and Therapeutics in the University of Vienna,
Austria.

GENTLEMEN,—The case I have to present to you to-day, at the last clinic of the year, is an extremely interesting one. The patient, as you see, is a young, well-developed man, with the general appearance of good health that would not lead us to think that there was a serious pathological condition present, and, above all, that that condition was a serious chronic intestinal affection.

His family and personal history contain practically nothing of importance for us; the history of his illness, on the other hand, is interesting and quite characteristic as a type of the affection from which he is suffering.

He is thirty years of age; a Bohemian; unmarried; his present occupation, a policeman. He was until two years ago a baker. His parents and a brother and sister are living and well. Two brothers are dead, one in infancy, the other in youth from lung trouble.

Personal History.—The patient was never ill, except for a light attack of measles in childhood, until he was twenty-one. He then had an attack of rheumatism which affected both feet, but did not involve any other joints, and from which he entirely recovered in eight days.

The history of his present illness is as follows: On October 8, 1896, the patient, in the fulfilment of his duties as policeman, was present at a fire. He had considerable work to do, and while engaged in it was suddenly taken with severe pain in the abdomen. This continued for some minutes and then became more bearable, though there remained a painful sense of pressure in the right inguinal and umbilical regions. The intermission did not last long;

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after five to eight minutes the pain became severe again.   These intervals of pain and remission continued, and he had to go home.

The next day he vomited frequently, and so for several days, especially after eating meat, and he had considerable diarrhœa.   The stools he describes as brownish usually, not feculent, containing a good deal of slime and some blood.   Under rest in bed and careful diet at home he did not improve much, so after two weeks he was taken to a hospital.   He remained in the hospital for just a month, until November 22, and then was so much improved that he thought he would be able to go on with his work.   He was for a while, but before the end of the year his pains returned with more intensity than ever.   The general symptoms became severe, he lost his appetite, vomited often, and had intervals of diarrhœa in which slime and blood were passed.   He again entered the hospital in January, 1897, and remained to the end of March.   Somewhat improved, he remained at home for two months on leave of absence from his police duty.

In June he went on duty as policeman again, but as the result of being on his feet almost continuously for some weeks all his old trouble returned with renewed intensity, and he came to our clinic about two weeks ago.   He now complains of recurring pains localized principally over the region of the transverse colon, about midway between the umbilicus and the ensiform cartilage.   These pains recur at intervals of about ten to fifteen minutes, and at times become almost unbearable.   He is not a querulous patient, and so we can be assured by his own statement in the matter of the real severity of the pain.   Besides this, the main feature of the case, as you see, he complains of loss of appetite and the frequent regurgitation of sour-tasting material.   He vomits frequently, and the vomit is ever intensely acid to the taste; it is composed of materials swallowed, sometimes partially digested, at other times of mucus and bile; it is never the least feculent in character, and he has never at any time vomited feculent material.   In addition to this he has diarrhœa, usually two to three stools daily, always liquid, only seldom containing feculent masses.   They are blackish-brown in color when abundant, and when scanty are composed of mucus and blood, as you may see in the specimens passing around.   He has had no fever at any time while in the hospital, and cannot recall that he has had fever during any of the attacks.

As the patient lies before us we find him a well-developed, strong-looking individual, whose muscles have not atrophied to any extent, whose color is that of health, his skin moist and normal, his tongue practically uncoated, his pulse normal in count, not quite as full as it should be, but perfectly regular in rhythm.   There is no cyanosis and no icterus, no marked pallor and no flushing of the skin.   His lungs and heart are normal, and we proceed at once to the examination of his abdomen.

Inspection shows the upper abdominal region more elevated than is normal in a man of thirty, and there is a prominence easily visible midway between the navel and the ensiform cartilage.   This prominence extends from one mammillary line to the other, and, besides, on the right it may be noted running down towards the cæcal region.   It does not exist immediately over the cæcum, but begins gradually some inches higher up.   The form of it cannot be described exactly, because, as you see, the tumor changes its appearance even while we are observing it.   It is now much more prominent in the umbilical region than it was, and there is a wave of movement passing over it.   The shape, the position, the change of form, and the wave of movement in it all go to show that it is an intestinal tumor.

Palpation gives a sense of resistance over the prominence, and this is particularly noticeable over what is normally the course of the large intestine, especially over where the upper part of the ascending colon and the transverse colon lie when not displaced; so that we are justified fully in suspecting that it is a pathological condition of the large intestine we have to deal with.

Percussion gives normal stomach tympany in the space between the prominence and the lower margin of the ribs on the left; over the tumor itself we get a duller note; over the rest of the abdomen, normal intestinal tympany.

The patient's anxious, pained expression shows that one of his periodical attacks is just about to come on, and so you will have a chance to observe the changes that occur in the tumor during an attack.   First note the increase and rapidity of the peristaltic movements over the rest of the abdomen.   It is not the storm of peristaltic movement that occurs in occlusion of the intestine, or even in severe stenosis, but there is enough to show that there is low down in the intestines some considerable impediment to the onward move-

ment of their contents, which acts reflexly to cause increase of peristalsis. The tumor itself now becomes decidedly more prominent, the angle between the ascending and transverse colon becomes more marked, the feeling of resistance to palpation becomes much greater, and the impression is conveyed of momentary tetanic contraction of the tumor under the fingers.

Gradually, as the attack passes off, the tumor resumes its former shape and consistence. It is now much softer to the feel. This change of consistence is important, for neoplasms of the intestines, however much they may be disturbed in their external relations by waves of peristalsis, always retain the same consistence. That this increased feeling of resistance over the colon is not merely due to a simple neurotic tetanic contraction of the muscular coat is evident from the fact that it is only increased resistance that is felt during the attack, but after it is over there always remains a prominence in this region, and a tumor may be made out, indicative of some persistent pathological condition.

Down in the left inguinal region deep pressure shows the presence of something under the fingers besides intestine. Here there is an uneven sense of resistance given by something that when pressed upon yields and seems to assume another form. After the removal of the pressure it does not return to its original form. Here we evidently have to do with a collection of fæces. The same procedure over the tumor shows that we have to deal with a smooth, resilient body that yields when pressed upon, but at once returns when pressure is removed. We evidently have not to deal with coprostasis in the transverse colon.

What have we, then? Is it an intestinal neoplasm? I have already said that its change in consistence would seem to exclude that, but sometimes such signs are illusory and need confirmation. The most frequent neoplasm of the intestines is cancer, and from its increasing frequency of occurrence it has become absolutely necessary to take the possibility of cancer into account in every case of chronic intestinal trouble. This increased frequency of cancer, and especially of intestinal cancer, is not merely apparent, and does not seem to be due to the fact that better diagnostic methods have led to their detection oftener. The fact is reported from all sides,— from England, Germany, France. Here in Vienna the statistics of the autopsy room of our General Hospital are startling enough. In

the twelve years from 1870 to 1881 one hundred cases of intestinal cancer were found, while in the twelve years from 1882 to 1893 two hundred and forty-two cases came to the autopsy table. This is not due to the fact that more cancer cases were retained in the hospital till the fatal termination during the second period than in the first, for the statistics of the living cases show a corresponding disproportion. To my own knowledge the character of the patients received into the hospital during the one and the other period has not changed. It is not merely among the poorer class of patients that this increase of intestinal cancer is noticeable, for I remember, in a talk with the late Professor Billroth in 1893, that we agreed that the number of cases of the affection in our private practice had greatly increased during the same period.

We must carefully exclude cancer here, then, but it is not hard to do. His age—you will say he is only thirty—practically excludes that; but there is another fact that is becoming clearer as statistics of cancer are being collected more carefully, and that is that cancer of the intestine may occur in comparatively young people, and the number of cases reported in patients under thirty is already very large, and would seem to be on the increase. The tumor is, however, too large for cancer, which usually occurs in small stenotic rings. As large a tumor as this would mean extensive metastases in abdominal organs and consequent cachexia, and that is not present in the case. The tumor is, besides, too smooth in outline for cancer, and not sufficiently hard. It has, however, many more points of similarity with the other form of malignant tumor,—sarcoma. You must remember the case that was before the clinic just about a month ago. The autopsy yesterday confirmed our diagnosis of intestinal sarcoma. The differential points on which we laid stress in making the diagnosis were the smoothness of outline of the tumor, the only moderate sense of resistance it gave on palpation, and the fact that it had caused none of the signs of intestinal obstruction. Two other diagnostic points that are usually of great value in the diagnosis of intestinal sarcoma were not present in the case. The tumor was comparatively not very large in size, and its growth had not been as rapid as is usual with sarcoma. The absence of these confirmatory symptoms was not enough to make us hesitate about the diagnosis. The autopsy disclosed a typical intestinal sarcoma, which had caused little if any narrowing of the lumen of the

intestine. Here the form of the tumor, its size and position, and its characteristic change of consistency under the influence of peristalsis, with the absence of cachexia, point to something very different from a malignant neoplasm. These points, taken together with its sudden development in a perfectly healthy individual, with an attack of pain followed later by vomiting and bloody stools, would lead us to think of intestinal invagination. The sausage-like tumor following the course of the large intestine is almost absolutely pathognomonic of the condition. Blood in the stools occurs as the result of either hyperæmia or ulceration. As there is no pus in the stools and no history that would point to dysentery, we can assume here that we have to deal with a hyperæmia. This can be best explained as the result of chronic invagination. The imprisonment of one part of the gut in another does not interfere with the arterial blood-supply, as arterial blood-pressure is enough to overcome the resistance offered by the constricting ring of intestine at the upper part of the invagination. The reflux of venous blood is, however, greatly hindered, and passive hyperæmia results. This leads to increased secretion, and finally to exudation of blood from the over-distended veins; hence the mucus and blood in the stools.

Intestinal invagination may occur in any part of the gut, and receives its name accordingly. It is iliac if it involves the ileum, colic if situated in the colon, and ileocæcal if the ileum forces its way into the large intestine. It is this last form that is seen oftenest, but that is because it occurs with great frequency in children, in whom the greater number of intestinal invaginations are observed. In adults the iliac and iliocæcal forms are observed with about equal frequency.

The chronic form of intestinal invagination, as we have it in our present case, is oftenest ileocæcal. Bauhin's valves at the end of the ileum are pushed on into the cæcum and colon, which are inverted and follow the advance of the small intestine into the large. In severe cases the ileocæcal valves may be pushed through the ascending, transverse, and descending colons, then through the rectum, and appear externally at the anus. Cases have even been reported in which a number of feet of gut have prolapsed at the anus, the ileocæcal valves always constituting the "head" of the invagination. In our case, notwithstanding that it has lasted now for months, examination per rectum does not allow of palpation of any portion of

the invaginated intestine. The ileum has evidently not found its way beyond the sigmoid flexure as yet.

As to the cause of intestinal invagination, it is extremely difficult to give a clear explanation. In the majority of the cases, as in our patient, it develops in people who have been in perfect health up to the time of the attack. It has been known to occur in healthy individuals during sleep without the slightest premonitory symptoms. Nurslings have been suddenly attacked with it while at the breast. In a notable proportion of cases an intestinal polyp has been found which has been caught by the peristaltic movements of a portion of intestine below its point of origin, and, being forced onward, has caused the invagination of the part to which it has its attachment. In a number of cases, too, intestinal troubles of various kinds have been reported as preceding the invagination, but the etiologic rôle of these affections is extremely hard to determine.

Intestinal invaginations have been divided into various kinds by different authors according to their mode and time of onset. It has long been noted by pathologists that a number of intestinal invaginations were found post mortem which had given no clinical symptoms. These were especially frequent in children. They were usually five centimetres or less in length, they could be easily reduced, and the involved intestine showed no signs of inflammatory reaction. These invaginations were looked upon as caused by the premature death or paralysis of certain parts of the intestine, which were then forced by the peristalsis of the death agony into neighboring parts. They were called agonal invaginations, and were considered as of no pathological importance. The others giving rise to serious symptoms were called vital or inflammatory or persistent invaginations.

For these names I should prefer to substitute pathologic and physiologic invagination. My own observations on dogs when their exposed intestines were kept in a normal salt solution at the body temperature showed me that invaginations in the course of ordinary peristalsis were not infrequent. They persisted but for a short time, seemingly gave rise to no symptoms, and were naturally and completely reduced by further peristaltic movements. The intestines of dogs resemble very closely those of man, and it is a question to my mind whether these peristaltic invaginations are not made and unmade physiologically in man, too. Cruveilhier is even of the

opinion that intestinal colic is often the result of these invaginations, this being the intermediate condition between physiological and genuine pathological invagination. Some inflammatory reaction is set up in these cases, but the intussusception is reduced naturally before serious persistent pathological changes are produced.

The pathological form of intestinal invagination is the persistent intussusception and retention of one part of the gut in another. Usually it produces acute symptoms, of which colic-like pains, usually followed by vomiting, some blood and slime in the stools, and often the presence of a sausage-like tumor are the most characteristic symptoms. It may run a most acute course, and cause death in from twenty-four hours to a week. But with this form, except inasmuch as it ushers in the chronic condition we have under consideration, we have nothing to do this morning,—that would require a clinic by itself. Even after the invagination has become chronic, however, it may again enter upon an acute course and produce symptoms of intestinal occlusion with fatal issue. Two theories have been advanced to explain intussusceptions. According to one, a passing paralysis of one portion of the intestine causes it, during peristalsis, to be received into a succeeding part where it is imprisoned; this is the paralytic theory. The other supposes that from some irritation there is produced a spasm of the circular and longitudinal muscle-fibres of a portion of the gut, and that this tetanically contracted portion is forced into the part, following it by normal or perhaps abnormally increased peristalsis. The latter theory is gradually coming to be the most generally accepted explanation.

Once it has occurred, the venous congestion due to the pressure upon the mesenteric veins at the point where they have been carried into the suscipiens—that is, the part of the gut into which the other or the susceptum has been forced—soon makes the possibility of reduction by the ordinary natural means of increased peristalsis an impossibility. Nature then sometimes finds an extraordinary mode of cure. The interference with the circulation causes gangrene of the invaginated portion of the intestine. This separates and is passed by the rectum, the peritoneal coverings of the suscipiens and susceptum are in very close contact at the point where the invagination begins, inflammatory adhesions occur, and so a spontaneous cure is effected. Very large portions of the intestine may be passed in this way and the patient return to perfect health.

In another class of cases though, for reasons that are unknown, very little inflammatory reaction takes place, though a good-sized portion of intestine has been invaginated for a long time. I have seen intestinal invaginations that had lasted for more than a year that could be reduced by very little traction after laparotomy. In some cases, even after long continuance, there seems to come a spontaneous cure. In others there are periods of remission in the symptoms, especially occurring after rest and careful diet, in which there would seem to be some spontaneous lessening of the invagination. Some such thing seems to have occurred after the hospitalization of our patient the first time, and perhaps later also. Now the condition seems to have become more persistent, and during his present stay in the hospital there has been little if any remission in his symptoms, the pain particularly occurring regularly at intervals and with very few failures to recur every ten minutes or so.

We are then brought face to face with the question as to what must be done for our patient, who is practically unable to resume his occupation under present circumstances, and whose loss of appetite and general sense of ill-feeling are bringing him to a state of inanition. Can we hope to reduce the invagination by medical means? In long-standing cases like this there is always the question, Have peritoneal adhesions formed between the suscipiens and susceptum portions of the intestine in the invagination? I have said that it seems possible from some personal experience that they may not have formed even after months, as in our case here. With the hope that they had not, insufflations of air and large injections of water were made into the rectum, in the hope of mechanically reducing the intussusception, but without success. These remedies have much more chance of success in the acute cases than in cases that have endured as long as this.

In the acute cases, however, it must always be borne in mind that intussusception is nearly always a surgical condition, and too much time must not be wasted in useless medical measures when, after one or two unsuccessful attempts to force the invaginated intestine back by pressure in the gut from below, no relief seems promised by these measures. In the purely iliac form of invagination it is more than doubtful if such measures are ever indicated. In the ileocolic form, where they are rationally most indicated, it must not be forgotten

that certain dangers are associated with forcing back the invaginated intestine.

If nature has begun her curative procedure of getting rid of the invaginated portion of intestine by gangrenous extirpation, it is more than likely that acute perforative peritonitis will follow the reduction of the intussusception. If inflammatory peritoneal adhesions have occurred, then it is more than likely that the spread of intestinal bacteria through the intestinal walls, owing to the lessened tissue-resistance after inflammatory and circulatory disturbance, will cause acute peritonitis. In such cases, therefore, a surgeon in consultation with the medical man is always a necessity, and the continuance of acute symptoms for more than twenty-four hours, or any symptom of peritonitis, is an indication for laparotomy.

In the chronic cases we might think that the medical man would be of more use, but it is practically not so. Injections of water or insufflation of air seldom are capable of forcing back the intestine where it has been long invaginated or more than a few inches of it are involved. They have been tried in our case here, but with no result. Considering the man's condition, there is nothing to do, then, but to advise operation. The operation should be a radical one in such cases, and should include the extirpation of all the intestine involved. Where for so long a time intestine has been invaginated, it has acquired a habitus that will lead to relapses of the condition if only simple reduction—the setting free of the invaginated portion—is performed.

The same thing happens where after chronic invagination there is a gradual working loose of the intussusceptum of itself. I remember a very striking case of this kind some years ago in a military man, where the diagnosis of intussusception was confirmed at the operation. He was taken suddenly ill with pains referred to the umbilical region; there were some bloody mucous stools, some vomiting, and the symptoms of a partial occlusion of the intestines. A tumor was found on palpation, and, as he was incapacitated for work by his condition and began to lose rapidly in weight, an operation was proposed. It was thought that a neoplasm of the intestines would be found. A day before the one set for operation all his symptoms disappeared. He refused to be operated on, regained his appetite rapidly, took on weight again, and left the hospital perfectly well. Just a year and a half later, while climbing a mountain, his

old symptoms suddenly returned. He had exactly the same pains as before, and the tumor recurred in the same place. This time his condition was more aggravated. The correct diagnosis of intussusception was made this time, and confirmed at the laparotomy.

The case illustrates the advisability of waiting a reasonable length of time in chronic cases, so as to allow nature, assisted by rest and careful diet, a chance to reduce the invagination if possible. The delay must never, however, be so long as to allow the patient to become so weakened that the success of the operation, which will almost surely have to come, will be rendered doubtful.

In the mean time, and also in cases where the patient, despite the physician's advice, refuses operation, the general treatment is important. With a partial occlusion of the intestines care must be taken that the diet be such as does not leave much excrementitious residue. The collection of fecal masses before the narrowed portion of the intestine may easily give rise to complete occlusion of the intestines. Vegetables as an article of diet must be as rigidly excluded from the dietary of cases of chronic invagination as from the corresponding cases of partial occlusion of the intestine from cancerous stenosis. Milk and eggs, with a modicum of meat, must form the almost exclusive food-supply.

The pains form the great symptom of the disease,—the one which most frequently brings the patient to a physician. They form the great indication for symptomatic treatment, but the treatment of them must be circumspect. The use of opium can lead very easily to dangerous collection of fæces by stilling peristalsis, and so cause complete occlusion of the narrowed intestine. Local measures are the safest. The patients themselves often find that in a certain position, or when pressure is applied in a certain way over the tumor by their position in bed, the pains are lessened, and they should be encouraged to look for such an alleviation. A bandage may be applied in various ways in the hope of finding some additional relief. The pains are partly due to the congestion in the invaginated portion, and this may be relieved by counter-irritants.

All in all, however, the medical man can do very little for the relief of the condition. We have advised our patient of this fact, and he has consented to the operation, which will be performed in Professor Albert's clinic in a few days.

And now, as this is the last clinic of the year, let me wish you

all a joyous vacation and a happy return, with health and strength recruited by the holidays for another year, in October. I have to thank you for your kind attention during the present year, and hope that you have gained as much instruction during the year as I have of pleasure in the teaching. Auf wieder sehen.

[Three days later the operation was performed in Professor Albert's clinic. The ileum was found invaginated in the colon as far as the splenic flexure, thus completely confirming the diagnosis. The ascending and transverse colon with the invaginated portion of the small intestine were removed.]

ENTERIC FEVER: EMPLOYMENT OF WIDAL'S SE-RUM AS A TEST FOR, AND REMARKS UPON SOME UNCOMMON INCIDENTS ARISING IN THE COURSE OF THE FEVER.

BY THOMAS OLIVER, M.A., M.D., F.R.C.P.,

Physician to the Royal Infirmary, Newcastle-upon-Tyne.

GENTLEMEN,—Many of you have seen with me in the wards up-stairs two cases of enteric fever, in regard to which any doubt that might have been present in our minds in the earlier part of the ill-ness was set at rest by both responding to Widal's serum test. I know of no illness which, when it is well defined and typical, is more easy of recognition, and none, when its symptoms and physical signs are indefinite, that may be more puzzling. Friends of a patient wish to have a name for his malady, and they pester the medical attendant until they get it. Beyond a rise of temperature, continued for sev-eral days, and a feeling of malaise there may be little or nothing to suggest typhoid fever, whereas in another patient there may be high temperature which oscillates considerably, but with no exacer-bation specially towards evening, no diarrhœa all through the illness, no gurgling felt in the ileocæcal region on pressure, and no rose-colored spots seen on the abdomen, and as a few râles are present in the lungs and the patient, who is in early manhood, is said to have been in rather depressed health previous to his illness, these circum-stances, whilst suggesting enteric fever, also include the possibility of tubercle. Some medical men have no difficulty in diagnosing typhoid fever, but they call every case typhoid fever in which, in the absence of local signs of inflammation, there is recorded at some time of the day, and for several days in succession, a rise of tempera-ture. In many instances they are probably right, but to found a

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diagnosis upon such slender data is a practice not to be commended, for once a diagnosis is made the mental avenue of the medical attendant is closed to other impressions. Seeing, therefore, that enteric fever is frequently accompanied by so very few, and sometimes indefinite, signs that its diagnosis, particularly in the early stages, is all but impossible, it would be a boon to the medical profession were it in possession of reliable means, the application of which would remove all uncertainty. It is for this reason that we welcome the advent of Widal's serum, even if succeeding events prove it to be a failure. Not so long ago our attention was directed to the diazo-reaction which was given by the urine of typhoid fever patients, and which, at first considered a reliable sign, has gradually receded from the position awarded to it, until at the present time we hear little or nothing of it. Ehrlich considered the diazo-reaction to be characteristic of typhoid fever, and that it depended upon the existence in the urine of enteric fever patients of certain aromatic bodies capable of producing definite color reactions with the diazo compounds. Did the urine in enteric fever alone give the reaction, it would, without doubt, be a valuable sign, but as we have found that the urine of patients suffering from tubercular disease gave it, and that the urines of healthy men who were taking particular kinds of medicine showed the same color reaction, we have dismissed the test as being unreliable in its results and tedious in its manipulation. It requires two solutions: one a one-half-per-cent. solution of sodium nitrite, the other a one-half-per-cent. solution of hydrochloric acid saturated with sulphanilic acid. These solutions are kept separate until required, when to forty parts of the sodium nitrite solution is added one part of the acid liquid. Through the operation of the hydrochloric acid upon the sodium nitrite nascent nitrous acid is liberated, which acts upon the sulphanilic acid, producing diazo-benzene-sulphonic acid. Equal quantities of the suspected urine and of this chemical compound are mixed together and covered with a small quantity of liquor ammoniæ, when the presence of a deep-red ring appearing at the junction of the fluids indicates the reaction in question. Although I have given you pretty fully the details of this test, I attach practically no importance to it.

Is Widal's serum test more reliable? It is now a little more than two years ago since Professor Widal brought before the Medical Society of the Paris Hospitals his new method of "sero-diag-

nosis," for which he claimed that typhoid fever could be almost instantly recognized by simply observing microscopically how the serum of a patient acted on a culture of Eberth's bacillus. The method consists in taking a drop of blood from a patient and adding to it a few drops of a young culture of typhoid bacilli. Almost immediately there will be seen under the microscope heaps or agglutinations of bacilli. It is upon this fact that the diagnosis of typhoid fever rests. Eight years ago it had been demonstrated that the serum of animals rendered immune to enteric fever caused agglutination of microbes, a condition also capable of being induced by the blood of patients convalescent from this disease. For some years, therefore, the facts of agglutination of bacilli and their immobilization were only regarded as an indication of immunity on the part of the animal, facts which Pfeiffer and Koll were quite familiar with, but it was reserved for Widal to show that the phenomena of agglutination was a "reaction of infection," and that it occurred in the blood taken from patients suffering from typhoid fever. So far I have only had the opportunity of trying it in two cases of enteric fever, in which, although I had no doubt in my own mind as to the nature of the illness, confirmatory evidence was immediately obtained by the use of Widal's serum.

The first case was that of a lad, aged fourteen years, in whom there was continued fever, but without any definite signs, except enlargement of the spleen. His blood responded to the test. The second case is even more instructive, for succeeding events have so strongly supported my original diagnosis as to place the nature of the illness beyond all possibility of doubt. Mary A. D., single, aged twenty-four years, was admitted under my care in a state of semi-stupor, with fairly high temperature, and numerous râles heard all over her chest. We could obtain no history as to the duration of her illness, nor as to how it commenced. She seemed extremely ill. On the following day, when I saw her, I was struck by the expression of the patient,—that in spite of the numerous mucous and bronchial râles in her chest, there was neither difficulty of breathing nor cyanosis, but pallor of the face, a bright eye, continued pyrexia, and albuminuria, and that whilst there was neither tumidity of the abdomen nor rose spots visible, no gurgling felt in the ileocæcal region, and no diarrhœa, the spleen was so enlarged that it could be felt below the costal arch. A few days' observation of the

patient, during which the râles gradually disappeared from the lungs and the spleen diminished in size, lent weight to my suspicion. I invited Professor Murray to give me the benefit of his assistance in the employment of Widal's test, and as several of you were in the ward at the time of its application, I need only mention that in a few minutes after a drop of blood, removed from the lobe of the patient's ear upon a sterilized platinum wire, had been added to a few drops of a sixteen hours' culture of Eberth's bacillus, agglutinated masses of micro-organisms formed and were seen to grow large under micro-scopic observation, a circumstance which confirmed the diagnosis already arrived at. It has been thought that this bacillary agglu-tination is the result of a vital reaction, but when we added a drop of the patient's blood to an old culture in which the bacilli were dead but floating about in the fluid, discrete and disintegrated, the dead bacilli, entire or broken, became massed together, clearly showing that the bacilli are attracted not by vital but by chemical conditions. Had I taken a drop of blood from a healthy subject, as I did on one occasion from one of my clinical clerks, and treated it similarly, the bacilli of the culture instead of becoming heaped together and immo-bile would have remained free and exhibited a degree of unwonted activity, which, since it is in excess of that shown by the bacilli in the uncontaminated culture, we must regard as the outcome of the stimulating influence upon them of healthy serum.

On the morning of my visit to the ward, when we applied Widal's sero-test, some of you may remember that I drew attention to two very important facts. One, that although the female patient was in one sense progressing as satisfactorily as might be expected from the state of her temperature, her ability to sleep and take food, and in the absence of vomiting and diarrhœa, there was just something about her general condition that showed that all was not progressing quite favorably. The other point was, that whilst the spleen rapidly diminished in size under observation so that it could no longer be felt by the fingers under the costal arch, there was a marked absence of leucocytes in the blood. I have noticed this disappearance of leuco-cytes from the blood in other acute illnesses, and it has generally meant that the crisis was not yet at hand, and that a severe illness was still before the patient. I simply mention this circumstance, the prognostic value of which may or may not be much, but I add to it this very important intelligence, so far as the girl with enteric

fever is concerned, that a few days subsequently to that on which we used Widal's test she had a sudden and severe intestinal hemorrhage, followed by intense collapse and a fall of temperature five degrees. Next day the hemorrhage from the bowels was repeated, and, although no change was observed in the other symptoms, the occurrence of intestinal hemorrhage clinched the diagnosis so far as it was made upon clinical data.

Thus far we have been dealing simply with recent methods for the diagnosis of enteric fever. It is not my intention to-day to give you in detail the symptomatology of typhoid fever, but rather to draw attention to some unusual circumstances that I have observed in the illness. Regarded by many as a disease of a non-infectious character, so far as direct contact of the healthy with the sick is concerned, the contagion being conveyed through water or milk contaminated by the dejecta of patients, there yet occur outbreaks of enteric fever in which circumstances show that the healthy must have became infected through personal contact with the sick, the contagion having been conveyed either through the intestinal excreta, the expired air, the exhalations from the skin, or by the urine. In typhoid fever, which is still called by the Germans typhus abdominalis, on account of the location of the disease, the lesion is usually in the intestine. It is in Peyer's patches and in the solitary glands of the ileum that we look for the pathological lesion, and yet I have seen one case at least where from first to last the brunt of the poison was borne by the lungs, and other two cases where the kidneys were the organs principally affected. The first case was that of a French sailor who was admitted from a French gunboat cruising near the Tyne. He had high temperature, râles in his chest, no diarrhœa, but his general appearance and the history of the case suggested that it was not an ordinary inflammatory or tubercular affection of the lungs, while the subsequent course of the illness showed that the case was typhoid fever. On the twenty-first or twenty-second day of the illness the crisis was reached, and although from first to last there had never been any abdominal symptoms, it is interesting to note that in spite of their absence there was the same susceptibility to relapse as is observed in the abdominal type of the disease. We had carefully dieted the patient all through his illness, as we had regarded the case as typhoid fever, but of a pulmonary type. When the crisis was reached and the temperature had for several days been normal,

the patient, who was still being carefully dieted, had an inordinate appetite. He was unfortunately allowed a mutton chop, and, although the temperature had been normal for eight or nine days, the ingestion of this animal food brought back all his symptoms and caused a relapse, accompanied by high temperature, which lasted again for twenty-one days, the interesting point being that while the gastro-intestinal tract was the primary seat of irritation, the symptoms of the disease were again entirely on the side of the lungs.

Nor are my cases of the renal type of typhoid fever less instructive and interesting. One of the patients was a girl, fourteen years of age, whom I saw, in consultation with my friend Dr. R. Campbell of this city, on account of a continuous hæmaturia, over which medicine had apparently no control. The illness had already lasted some time, had been preceded by several days of indisposition, and was accompanied by a rise of temperature, but from the beginning to the end of her illness there were no other signs or symptoms than the presence of blood in the urine. Her brother and she had been living at the sea-side, and exposed to the same influences. At the time of her illness the brother was also lying ill in bed, his case being one of genuine typhoid fever. He had sickened two days prior to his sister, and although his illness was a moderately severe one, it was unattended by any serious complications. He got the turn on the twenty-first day, and exactly two days afterwards his sister's temperature also fell, and with this fall of temperature, and without further medicinal treatment, the hæmaturia ceased. The facts of the girl having been exposed to the same infection as her brother, of the illness lasting the same period, and that when the crisis was reached improvement immediately began, are circumstances that strongly support the supposition of the illness having been typhoid fever, and that the poison had exerted its malign influence upon the kidneys.

It is unnecessary to dilate upon other similar cases, or to do more than mention the occurrence of cases in which enteric and malarial symptoms are combined,—cases which are spoken of as typho-malarial, and which I found illustrated in some English sailors a few years ago who had been living on the Danube.

There are three diseases, but this does not include all, which closely resemble enteric fever. Tubercular ulceration of the intestines, tubercular peritonitis, and acute miliary tuberculosis have been confounded with it. In a person who is suffering from tubercular

ulceration of the bowels there are usually present signs of phthisis in the lungs; in tubercular peritonitis there are vomiting and signs of matting together of the intestines or of the presence of fluid, free or encysted, in the abdominal cavity. In both cases there would probably be an illness of longer duration than that of enteric fever, and a history of the patient having exhibited for some time before taking to his bed signs of ill health. As for acute miliary tuberculosis, it is sometimes quite impossible to differentiate between it and typhoid fever. It is an interesting pathological fact that patients who are suffering from phthisis do not readily become the victims of the bacillus of typhoid fever. While the one disease seems to confer a degree of comparative immunity to the other, the converse does not hold. We all know how frequently patients who have passed through an attack of typhoid fever shortly afterwards succumb to phthisis, and, on the other hand, it has been experimentally shown that in feeding dogs upon a mash containing large quantities of the micro-organisms of typhoid fever, it is not typhoid fever that is produced, but pulmonary phthisis which carries the animals off. The enteric poison operates to so reduce the vital resistance that the animal readily becomes a prey to the bacillus of tubercle.

ENTEROPTOSIS.

CLINICAL LECTURE DELIVERED AT THE PARIS MEDICAL SCHOOL.

BY PROFESSOR DEBOVE, M.D.,

Clinical Professor of the Practice of Medicine in the Faculty of Medicine, Paris, France.

GENTLEMEN,—Enteroptosis is a morbid condition which has not as yet been clearly and completely defined; there still remains a certain number of obscure points for future observers to clear up. Even as it is at present known, enteroptosis presents a sufficient number of phenomena to give it a place of its own in medical terminology. The affection has been studied and described by Glenard, of Lyons, and by the Lyons Medical School, and the description which I am about to give you belongs entirely to this school.

In considering exclusively the etymological sense of the word "enteroptosis," we might be led to conclude that it simply means a "falling" of the intestines, and it was in this way that the word was formerly used. But this is not the exact meaning. Numerous and conscientious researches have shown that in enteroptosis it is not merely the intestines which have fallen, but that there is likewise a greater or less degree of descent of the liver, kidneys, spleen, and stomach, and that it is more in strict accordance with the exact condition to accept the meaning of the word "enteroptosis" as a falling of the abdominal viscera. This falling is very easily explained, first, by the weakness of the mesenteric attachments, and, secondly, by the instability or insufficiency of the means of support for the abdominal viscera.

Before describing the malady, properly speaking, and giving an account of its onset, progress, and subjective symptoms, I think it advisable to begin by telling you what you will observe in a patient having enteroptosis, even before you have begun to question him. When such a patient presents himself he should be examined in three

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positions,—standing, sitting, and lying down. When the patient is standing you will find that the anterior wall of the abdomen is flaccid and that there is a prominence below the umbilicus. This prominence is due to the descent of the viscera in accordance with the law of gravity and their accumulation, so to speak, in the lower portion of the abdomen. Now seat your patient, and you will find that the abdomen spreads out over the thighs. When, finally, you examine the patient in the recumbent position on his bed, the abdomen appears to divide itself into two portions, forming in stout persons a large roll on either side, while in the centre there is a concavity or depression. You thus have already a certain number of objective symptoms, which, while they are not sufficient to establish a diagnosis, are nevertheless of considerable importance, since they give you a clue to the existing condition.

We shall now pass to the other methods of investigation. Upon palpation you will first notice, in the cases in which the affection is well advanced, the presence of a transverse cord below the umbilicus. This cord recedes under the finger with a slight crepitation. Now, what is this cord? It is the transverse colon, which is displaced downward. You will be able to raise it, but it will be impossible to make it descend, for the simple reason that the transverse colon is attached to the vertebral column, and it is the mesocolon which prevents its sudden descent. It is, of course, not alone the colon which is displaced. The cæcum as well as the sigmoid flexure are also displaced inwardly. This latter portion of the intestine produces in enteroptosis an analogous sensation to that described in the transverse colon. You seem to have a cord under your fingers, and it is this cord which Glenard has designated as the "sigmoid cord."

The small intestine does not furnish any very reliable indication, as it slips away upon palpation. With reference to palpation of the stomach, I must tell you that it presents considerable difficulty. A whole series of procedures have been devised to accomplish this. The method resorted to by me, and which I recommend, since it generally furnishes pretty good results, is as follows: I cause the patient to swallow a certain quantity of carbonate of sodium and a small quantity of a solution of tartaric acid. Carbonic acid is thus formed and the gas distends the stomach, thus bringing the organ sufficiently into relief to enable one to readily distinguish its position. Thanks to this procedure, or some other which you may employ in prefer-

ence, you will find in enteroptosis the condition known as "vertical dislocation."

What is this vertical dislocation? It is a downward displacement of the stomach, accompanied by a certain amount of torsion. Your knowledge of anatomy will show you that the stomach can only be displaced in a vertical direction.

For, although the support afforded by the lesser omentum may become relaxed, there is one restraining element which will not allow of its lateral displacement. This connecting link is formed by its continuity with the œsophagus. Therefore in enteroptosis we have a vertical displacement of the stomach.

There is also another sign of considerable importance, consisting in the ability to feel the abdominal aorta. In the normal state the intestines lie between the palpating hand and the abdominal aorta, and do not allow the pulsations of this artery to be distinctly felt, but in patients suffering from enteroptosis, the intestinal apparatus being displaced downward, the hand, when depressing the anterior wall of the stomach, readily comes in contact with the artery. I must add, however, that too much dependence should not be placed upon this sign, for in certain individuals, particularly in neuropathic subjects, it is possible to feel the pulsation of the abdominal aorta. The liver is also somewhat lowered and twisted so that its upper surface becomes the anterior portion. This torsion is also termed a "dislocation." In some cases the liver will be found to be almost entirely freed from its attachments, forming a genuine floating liver. I must tell you, however, that these cases, in which the enteroptosis is so greatly developed, are very exceptional. The falling of the liver may give rise to quite a serious error, since it may be mistaken for hypertrophy of the organ.

We now come to another organ in which the displacement is likely to be the most pronounced. I refer to the kidney. You will observe that I say "the kidney," and not "the kidneys." While it is possible that the displacement of this organ may be bilateral, this happens so rarely that it need hardly be considered. In the very great majority of cases only one kidney, the right one usually, is displaced. It has long been a question why the right kidney should always be the one to be thus affected, but no satisfactory solution has yet been reached, unless it be the following one. It is supposed that the right kidney is much more frequently displaced than the

left from the fact that it is in direct relation with the liver, and that the corset by pressing upon the liver produces this effect upon the kidney. While this is merely a theory, it is nevertheless a plausible one. Thus in speaking of displacement of the kidney in enteroptosis, it is always the right one which is referred to. There are two degrees of falling, one slight and one pronounced; in the latter the condition is what is generally termed "floating kidney." Slight falling of the kidney is distinguishable by the following procedure: When in a healthy individual, in whom the abdominal viscera occupy the normal position, you seize between the thumb and the other fingers— as in a pair of pincers—the lateral portion of the trunk bounded by the costal edges above and the crest of the iliac bone below, and can feel the lower rounded extremity of the kidney, which recedes under the fingers. In a subject attacked by enteroptosis, on the contrary, the thumb reaches the centre of the kidney. The latter is unmistakable and can be readily compressed. Of course, between the two degrees just cited a series of intermediate ones exists. When the falling is very marked, and the supports of the kidney no longer fulfil their functions, we have what is called "floating kidney." This condition gives rise to a considerable number of errors in diagnosis. I therefore lay stress upon it, and call your attention to the fact that it exists much more frequently than is supposed. It should always be looked for, and when existing will frequently give you the clue to the only proper solution of the case.

I will now take up the subjective symptoms. Patients suffering from enteroptosis experience pains, genuine cramps, and sometimes attacks which are attributed to constipation or to hydronephrosis,— dilatation of the kidney by the urine, which is probably due to the fact that the kidney has fallen out of its normal position, and has at the same time become somewhat twisted, so that the urine cannot flow freely through the ureters. As soon as the kidney assumes its normal position the violent pains cease. To convince yourselves that hydronephrosis plays an important rôle in such attacks you have only to carefully examine the patient at such a time, and you will find that the kidney is increased in volume.

The progress of the disease under consideration is always slow and of a chronic character. The beginning is very gradual, and often passes unnoticed.

Does enteroptosis of itself produce death? No; but it should

be remembered that it may be an indirect factor in causing death. Without the occurrence of some pathological accident enteroptosis does not cause death, but the patient, having become weakened and enervated from the different conditions characterizing the disease, particularly the severe attacks of pain, offers much less resistance to the onset of any malady, and he succumbs during some critical stage of the disease. Enteroptosis should not, therefore, be regarded as an unimportant and innocuous malady.

We now come to the causes of the disease: they are of two kinds, predisposing and exciting. Among the predisposing causes the most important is a lack of tone in the individual tissues. You know that the means of support of the abdominal viscera are not distinguished for their solidity, but that the contrary is the case; thus very heavy organs are held in position simply by folds of the peritoneum, which offer but little resistance, or perhaps only by a more or less dense cellular tissue, as is the case with the kidney. Add to this the fact that the heaviest organs, such as the liver and spleen, are suspended, as it were, from the roof of the abdominal cavity, it becomes evident that when these supporting elements are weakened, the viscera— obeying the law of gravity—have a tendency to fall, thus giving rise to enteroptosis. Certain individuals, moreover, are more liable than others to become affected by the disease under discussion.

The exciting causes are more numerous. Sometimes they may entirely escape our notice. The intestinal origin of the malady consists in the fact that when there is obstinate constipation the fecal matter accumulates in the colon, and particularly in the transverse colon; it finally hardens, presses upon the colon, and causes it to fall. This is the starting-point, and if the determining cause persists, the other viscera also fall.

In persons subject to a stricture of the pylorus, a dilatation of the stomach is produced which causes a displacement of the latter,— the first stage of enteroptosis,—which gradually progresses, owing to the existence of constipation, which is always a complication of stricture of the pylorus.

Another cause lies in the relaxation of the anterior abdominal wall. You are aware that in women who have had several successive pregnancies relaxation of the anterior wall of the abdomen is often present. In such cases, the intestines, being no longer compressed, or at least held in place by the abdominal wall, fall, obeying the law

of gravity, and in time a more or less marked enteroptosis is the result.

I now come to the main cause of the disease, a factor which explains the very much greater frequency of this disease in women than in men. You have perhaps already guessed that I refer to the corset. Many physicians contend that the greatest blame is due to the corset, which by compressing the liver is the first determining cause of this affection. Are they right in thus affirming that the corset is so greatly at fault? Probably they are, but the quesion has not yet been definitely settled.

I should here mention that a frequent source of error lies in the fact that neuropathic subjects frequently complain of various troubles which you may attribute to enteroptosis, but which are neuropathic symptoms.

The diagnosis in the majority of cases is very easy when the disease is sufficiently advanced. I have a piece of advice to give you which will, I am sure, prove very useful. Whenever you have before you vague abdominal disturbances, think of enteroptosis. In many cases this thought will establish your diagnosis. Examine the right kidney, and very frequently you will find it displaced or floating, in which case all indecision should be at an end.

The treatment, as in all other diseased conditions, should be both prophylactic and curative. The prophylactic treatment would be simple, indeed, were it possible to carry it out. It consists in abolishing the corset, but you know as well as I do that this is wellnigh impossible, and that you will rarely meet a woman who will agree to follow your beneficial counsel. In ninety-nine cases out of a hundred she will prefer to bear all possible ills rather than discard her corset. It might perhaps be possible to modify the corset in such a way that it would no longer be injurious, but, notwithstanding the many modifications recently proposed, none have as yet been accepted, for the simple reason that while the modified corset satisfies the laws of hygiene it does not satisfy the accepted ideas of personal appearance. Although I am decidedly sceptical upon this point, and am convinced that women will in the face of all the evidence advanced to prove the harmfulness of the custom continue to wear the corset, I nevertheless advise you to use your best endeavors to suppress it. You will then have the consciousness of having done your duty, whatever be the result.

The curative treatment consists, first of all, in making the patient wear a hypogastric belt. These belts are sometimes very beneficial, and I have often heard patients say that they afforded them great relief. But this is not invariably the case, as many patients say that the belt has not done them the slightest good, while others attribute the aggravation of their trouble to its use. Be this as it may, I am inclined to think that the dislike of the patient to wearing such a belt is due more to some possible disfigurement of her shape which may result than to any discomfort from its use. It is well, however, to support the abdominal walls in one way or another.

Constipation should be constantly combated, either by rectal injections or by massage.

I have still a few words to say with regard to the treatment of "floating kidney." A certain number of surgeons resort to a special method of treatment which consists in opening the abdomen, and attaching the kidney to the psoas muscles by suture,—i.e, nephror-rhaphy. However seductive this method may be in theory, it has not given the practical results which were expected from it. At first the result may appear good, but later on the artificial attachments relax little by little, and the kidney again becomes "floating." I would therefore advise great caution in deciding the question of operation, and would not be misled by any statements of unduly enthusiastic operators.

CONGENITAL DEFECT OF THE HEART AND OTHER PARTS; PROGNOSIS AND MANAGEMENT.

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GENTLEMEN,—Cases of congenital defect of the heart are often looked upon as patients whose condition is of clinical and pathological interest, but at the same time as cases incapable of much benefit from medical treatment. I wish to draw your attention to certain points in cases of congenital defect generally that demand careful consideration as to clinical examination, prognosis, and treatment; and as to the advice that may be offered for the benefit of the patient.

CASE I.—You have seen in the wards a boy, aged thirteen years, whose general appearance at once arrested attention, owing to the blueness of his face; this cyanosis extends all over the body, the fingers are of a bluish-red color, and the venous blood is seen under the finger-nails. The fingers and toes are not clubbed as in many cases of cyanosis; the palms of the hands perspire much, as is frequently found in cases of any congenital weakness. The cyanosis extends to the mucous membranes; his lips are swollen at the margins and crooked, while the inside of the mouth, the tongue, and the conjunctiva all show the venous color. The lobes of the ears are large and blue; but, with all these indications of the results of a defective circulation, there is no over-fulness of veins, no œdema, and no distress to the patient. On palpating the præcordium the apex beat is felt at the normal site, and a diastolic "click," or shock from forcible closure of the pulmonary valves, is distinctly felt in the third left intercostal space. A systolic bellows murmur is heard of maximum intensity at the second intercostal space near the left border of the

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sternum, conducted in every direction, but most distinctly towards the left sterno-clavicular joint. The pulse is weak in either radial; if one arm is raised and the other hangs down, blood gravitates into the dependent limb as in the normal subject. His general health is good; weight four stones six pounds. He appears to be an intelligent boy, and is in the fifth standard at school. He is very deaf; this trouble began three years ago. My colleague, Mr. T. Mark Hovell, examined the boy and reported that the nasopharyngeal passages were clear, but that the mucous membrane was everywhere congested; both tympanitic membranes were depressed. For this condition frequent employment of Politzer's inflater was recommended.

No other conditions of congenital defect, such as will be mentioned presently, were present in this boy. The case illustrates the need of watchful care of the conditions of mucous membranes in the state of cyanosis, with special reference to prevention of deafness, the cause of which has been here neglected in the past, adding to his difficulties in life.

CASE II.—Lilian C. was an imbecile girl, two years old; she died the second day after admission to the hospital. You see here the pathological specimens that have been preserved in our Museum; for a description of the brain and the accompanying photograph, I am indebted to Dr. Sequira, our medical registrar.

The *brain*, when removed, weighed twenty-four ounces; the normal weight at two years is about thirty ounces. The special point of interest is the extraordinary convoluted appearance of the cortex. The usual fissures are present, but the lobes between them are subdivided by numerous shallow sulci, which break up the surface into a remarkable number of small gyri. This condition affects all the lobes, but is most extensive in the temporo-sphenoidal and occipital regions. The right side of the brain is more convoluted than the left, and this is especially marked in the right opercular region.

The *heart* is also malformed. The right ventricle is larger than the left, and its walls are thicker. The pulmonary orifice is constricted. The septum ventriculorum is deficient above, and the orifice thus left is guarded by three rounded valve-like folds. The aorta arises above this opening, mainly from the right ventricle. The ductus arteriosus is patent.

The *kidneys* are united, and present the common horseshoe appearance. Both are slightly lobulated. The left ureter arises from

Brain of two year old female imbecile child, showing extraordinary con-
voluted appearance of cortex.

a deep sulcus on the anterior surface of the left kidney, and the right from a shallow groove on the anterior surface of the right.

There was also a cyst at the back of the right eyeball, which was itself much smaller than the left. ·

This case shows that several gross defects in development may be associated in the same child; having found one defect, we should look for others; it is also seen that with congenital defect of the heart we may have defect of the brain, such as in a young infant may be easily overlooked unless a careful clinical examination is made.

The following table gives the sex, age, and mortality among forty-seven cases of congenital defect of the heart; it shows that twenty-three lived to over five years of age; the proportion of male cases is slightly higher than among the females, but the mortality was higher with the females. This corresponds with the experience of other classes of congenital defect. There are more imbecile boys than girls, but the mortality is higher among the females; speaking generally of less gross cases than those given below, there is more maldevelopment among boys, but the girls are in such cases more delicate.

CASES OF CONGENITAL DEFECT OF THE HEART ADMITTED TO THE LONDON HOSPITAL, 1880–96.

Age.	Discharged.		Died.		Total.	
	Male.	Female.	Male.	Female.	Male.	Female.
0 to 5 years	10	7	2	5	12	12
5 " 10 "	4	4	..	2	4	6
10 " 15 "	2	2	1	..	8	2
15 ' 20 "	8	..	..	..	8	..
Over 20 "	8	2	..	..	8	2
	22	15	8	7	25	22

As further illustration of the frequent association of malformation of the heart, with other defects in the body or the brain, I will read notes of six other cases among children.

HEART DEFECT; FINGERS CLUBBED; CYANOSIS; PALATE CLEFT.

CASE III.—Girl, aged five years; a cyanotic child, with marked clubbing of the fingers and toes. There was occasional slight irregularity of the heart's action. A systolic bruit of blowing character was heard all over the cardiac area, but was most intense over the third left costal cartilage; it was traceable into the axilla, and there became faint, but was more audible in the left vertebral groove at

the level of the second dorsal vertebra. The apex-beat was under the nipple; the heart's impulse was of good strength; the area of heart-dulness was distinct and of normal size. Pulse feeble, slightly irregular, 70. Lungs clear; no œdema anywhere. The child was dull in mental powers, and had always been backward; she never had convulsions; there were no signs of rickets; the palate was cleft.

This girl was the fifth child in the family; the parents appeared healthy, and no special trouble occurred to the mother while carrying this child; she had had no miscarriages. The other children appeared healthy, but a boy born the last previous to patient died at two months from "erysipelas."

HEART DEFECT; NO CYANOSIS; DEFORMITY OF HANDS; EPILEPSY IN FAMILY.

CASE IV.—Boy, aged three years. There was marked deformity of the right hand. There was no apparent defect in the bones of the forearm or carpus; muscles, nerves, and vessels appeared normal on either side; the deformity was only in the metacarpal and phalangeal bones. The most noticeable feature was the apparent division of the metacarpus into two parts, having the little finger and ring-finger complete on the inner part, and on the outer side an index-finger and thumb well shaped; but there was no middle finger, and the two portions of the hand spread widely apart; the nails were all perfect. No symptoms pointed to heart-disease. On examination there was no hypertrophy of the heart detected; its apex-beat was displaced a little upward and outward behind the nipple; there was no epigastric pulsation; the area of cardiac dulness was normal. A systolic bellows murmur somewhat varying in intensity was heard at the base, loudest towards the aortic cartilage and right sterno-clavicular joint, also very audible over the pulmonary cartilage, but not at the apex or at the back; second sound clear. Pulse good; no cyanosis; no clubbing of fingers.

The maternal grandfather, aged sixty, is epileptic, and has been so since he was a boy. No other case of deformity is known in the family. The following is the history of the family. The mother has had ten pregnancies: 1. Still-born at eight months. 2. Born at full term; died at seven weeks old. 3. Boy, aged sixteen years, now in an asylum; has been under my care for epilepsy; he was born at full term. 4. Born at full term; appeared healthy; died at four

months old in a fit. 5. Born at full term; died at eleven weeks. 6. Boy, born at full term; aged eleven years; appears healthy. 7. Boy, born at full term; aged eight years; epileptic; now under my care. 8. Patient, born at full term; now aged five years; the patient described. 9. Miscarriage at three or four months. 10. Boy, aged fifteen months; born at full term; appears healthy. The mother while carrying patient had no special fright, but says she dwelt much on accounts of the "Wainwright murder." There appears no proof that this caused any illness or affected the child.

MITRAL AND TRICUSPID DISEASE; NO CYANOSIS; MALFORMATION OF HANDS.

CASE V.—Charlotte W., aged forty-six years, an in-patient at the London Hospital on account of attacks of palpitation. She had good health till a year before admission, when she began to suffer from attacks of palpitation. When the hands were held out an obvious deformity of posture was seen. In either hand the condition was the same: there was a general tendency of all the fingers to bend over to the ulnar side; in each thumb the first phalanx was naturally bent inward at right angles to the metacarpal bone, while the second phalanx was extended back upon the first, thus producing a peculiar crooked position of the thumbs. There was no joint affection and no rigidity. There appeared distinct evidence that this condition had existed from birth. The pulse was feeble and irregular. There was a systolic bellows murmur heard loudest to right of sternum over fourth cartilage. A second systolic murmur presented the ordinary characters of a mitral regurgitant bruit. The two bruits were of a different pitch. Dr. Sansom, who kindly saw the case with me, agreed that we probably had a defect of both mitral and tricuspid valves. She has not had rheumatic fever, but had scarlet fever when sixteen years old. Cardiac symptoms have only troubled her about a year, during which time she had worked very hard in a warehouse.

HEART DEFECT; CONGENITAL CYANOSIS; LEFT HEMIPLEGIA, DEPENDENT UPON DEFECT OF RIGHT HEMISPHERE; BELL'S PARALYSIS ON RIGHT SIDE OF FACE, WITH DEFORMITY OF RIGHT EAR.

CASE VI.—Girl, aged one year and nine months; a very ill developed, cyanotic child. The cardiac impulse was forcible, suggest-

ing hypertrophy of the heart, and the apex-beat was slightly displaced outward; the area of dulness was well defined, but not enlarged. A loud systolic bellows murmur was heard all over the præcordial region, but with greatest intensity over the second left cartilage. Pulse was full and strong. Cyanosis was very pronounced and constant. The fingers and toes were slightly but distinctly clubbed. The child died in Darenth Asylum. Certain convolutions of the brain were found wasted; leave could not be obtained to examine the heart. The skull was not deformed, but the right external ear was very rudimentary, smaller than the left, ill shaped, and adherent to the skull, the tragus being the only part fairly well formed. The meatus was large in its vertical diameter; there was purulent discharge from it. The left ear was well shaped, but was also the seat of otorrhœa.

HEART DEFECT WITHOUT CARDIAC SYMPTOMS; NO CYANOSIS; ONE EAR DEFORMED.

Case VII.—Boy, one year old, was brought to me for advice as to an ear deformity in December, 1879. Neither signs nor symptoms directed attention to the heart, but it was examined in routine. The right ear was well formed. On the left side the external ear was very small, in vertical measurement one inch, as against two inches on the right side; all parts were present, but small. The upper portion of the external ear was drawn downward, but it could be lifted up. There was a loud systolic bellows murmur of somewhat rasping character in the pulmonary area, also heard very distinctly at the apex, and but faintly heard at the angle of the scapula. The second sound was clear, both the aortic and probably also the pulmonary. The heart's impulse was forcible, and a thrill was felt at the apex.

At present the bruit remains unchanged; the right mastoid cells have not developed, but the external ear, while retaining its peculiarities, has grown somewhat.

CONGENITAL HEART DEFECT, WITH A VARYING BRUIT; NO CYANOSIS; PATENCY OF INTERAURICULAR SEPTUM; WANT OF POWER IN LEGS FROM BIRTH, WITH SOME RIGIDITY OF LEFT.

Case VIII.— Millicent L., aged six months, came as an out-patient. The mother complained that the girl was "absent in her mind;" that her legs felt as if useless; she had cough, was emaciated, and was restless at night.

There was no cyanosis, but the heart was especially examined on account of the evident congenital want of power in the legs. A very loud systolic bellows murmur was heard at the apex of the heart, well conducted to the axilla; it was also heard in the pulmonary area. The second sound was normal. The heart's impulse was fairly strong, especially as felt at the epigastrium; the area of dulness was very pronounced, and the right ventricle appeared to be hypertrophied, as the impulse and dulness extended to the right of the median line. The pulse was fairly strong. The fingers and feet were not clubbed; nails normal. The head measured fifteen inches in circumference; the fontanelle was depressed; the palate was highly arched; the ears were well shaped. When the limbs were examined very little movement was seen, especially in the left leg, which hardly moved on tickling. Both legs were very thin, the left not more wasted than the right, but quite useless; occasionally a little spontaneous movement in it was seen. On tickling the foot, the leg became rigid from spasm. But little movement occurred in the fingers and toes. There was more spontaneous movement in the right leg. She would at times grasp one's fingers, and the movements of the hands and fingers appeared natural; the arms were fairly moved also. The spine appeared normal. The child was feeble and could hold up her head. There was no squint or facial palsy. The child was born at full term. While carrying this child the mother was ailing; she said the child lay too much towards the right hip; she had cough, and between the third and fourth months was frightened, but this did not make her ill; the labor was long.

History of Pregnancies.—1. A boy, aged sixteen years; healthy. 2. A boy, aged twelve years; has abscesses. 3. A boy, aged nine years; healthy. 4. A boy, aged seven years; seems healthy. 5. Boy, aged five years; seems healthy. 6. Boy, aged three years; seems healthy. 7. Miscarriage. 8. Patient.

When seen again, February 5, the bruit was not audible, but the cardiac impulse and beat of the right ventricle in the epigastrium were as strong as before. The child was ill, emaciated; resonance over the lungs was impaired, crepitations over the lungs were heard, but the pulse continued good. She was admitted and died.

Post-mortem.—Double hydrothorax; lungs congested and in parts collapsed. Liver, spleen, kidneys, and brain appeared normal. The only malformation in the heart was an opening in the inter-

auricular septum large enough to admit the tip of the little finger; this was below the fossa ovale, which was closed. The four sets of valves were perfect, and the cavities, except as described, were normal; the vessels were normal, and the ductus arterious closed. It seems probable that the bruit was caused by the passage of blood from the left to the right auricle; there being no cyanosis, it is not likely that blood passed from the right to the left auricle. This, of course, supposes that the tension in the left auricle was usually greater than in the right; when, however, the lungs became congested and œdematous, the tension would naturally rise in the right auricle and right side of the heart. This would check the passage of blood from the left to the right auricle, and accounts for the disappearance of the bruit when the child was last seen.

The cases narrated show that associated with congenital defect of the heart we may find other gross defects, and that the brain is also apt to be either maldeveloped or unsound in its action.

I now pass on to speak of children with any defect in their bodily development, as to their general or constitutional condition. For this purpose I shall base my remarks on my experience in examining one hundred thousand children in schools. The full facts are given in a report[1] published, and without troubling you with details or statistics I will give some general results. A case of defect in development of body in one or more points is apt to be subnormal or faulty in other ways. With badly made head or features, the child is apt to become delicate, with low status in brain-power and mental ability. When two or more defects of body are associated in the case, there is a greater probability of a low constitutional status following. From a large accumulation of observations that I have made, the following generalization may be given:

"Children with developmental defects of any kind are often delicate, and show a lower brain status both in disorderly motor action and in mental power."

Taking all cases with any developmental defect of cranium, palate, external ear, palpebral fissures, nose, and other developmental defects, the results of their examination show the following conditions associated in percentages of frequency among fifty thousand school-children seen:

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[1] "Report on the Scientific Study of the Physical and Mental Conditions of Childhood." Published at Parkes Museum, Margaret Street, London, W.

	Seven years and under.		Eight to ten.		Eleven and over.		All ages.	
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
Percentage with abnormal nerve signs . . .	31.7	28.5	43.3	41.4	45.5	44.0	38.4	36.2
Percentage pale, thin, delicate	22.7	35.0	11.0	22.1	7.5	15.0	16.2	26.3
Percentage dull or backward mentally .	36.6	40.8	41.2	46.6	37.1	51.1	38.4	44.9

Cases with developmental defect, boys, 2308; girls, 1618.

Enough has been said to show that in cases of congenital defect of the heart or other parts of the body care should be taken to make a complete clinical examination of the child, including a search for other developmental defects. It is also necessary to consider the outcome of such defect, as of cyanosis in its effects on mucous membrane and on the brain. The condition of the nerve-system is noteworthy. I might tell you of cases where a cleft palate had been closed in an infant and hemiplegia overlooked, or where a very rudimentary ear attracted much attention, but the coincident imbecility was not noticed till later years; such mistakes are preventable. The infant with a small head and premature ossification is apt to become marasmic and die. A narrow palate and small mouth are often associated with adenoid growths, and it may be with myopia; many boys who stammer have also defect of the heart; an infantile larynx and attendant childish voice after adolescence I have found associated with imperfect testes or a small uterus and painful menstruation. The Register General for England has shown, in successive reports, the increasing number of male deaths under the heading "congenital defect;" while the survivors give much trouble in social life and in education.

The points to which attention has been drawn affect the prognosis and management of the case. Such a child should be kept under observation and the physician should watch the health, growth and development of the body, and mental power, advising as to care from time to time. Sight, hearing, nerve-status, condition of mucous membranes and skin, and the teeth should be watched; much may be done for the child by the prevention of added defects through the period of educational training. It is in the younger years, and especially among girls, that the chief indications of delicacy appear, and again towards adolescence. Details in the care of such children I dwelt on in a former clinical lecture,[1] to which I will refer you.

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[1] See INTERNATIONAL CLINICS, 1894.

A CASE OF PERNICIOUS ANÆMIA.

CLINICAL LECTURE DELIVERED AT THE EDINBURGH ROYAL INFIRMARY.

BY ALEX. JAMES, M.D., F.R.C.P. (Edin.),

Physician to the Edinburgh Royal Infirmary.

GENTLEMEN,—James T., aged fifty-three, a plasterer, was admitted to Ward 31, May 3, 1897, complaining of shortness of breath and weakness on exertion.

Family History.—His father died, aged fifty-one, of consumption, his mother, aged seventy-one, of old age, and he has only one brother, who is alive and healthy, aged fifty-one.

Social History.—This is also fairly good; his surroundings as regards food and work have been favorable. He has been a very moderate drinker and smoker.

Previous Illnesses.—He had measles and whooping-cough when a child. He has had no other illness, but he tells us that he has always had a tendency to constipation, and that fifteen years ago he, for months, or even years, was very much troubled with piles, and lost then very considerable quantities of blood.

Present Illness.—Patient states that he was in his ordinary health until the beginning of this year. As the result, he thinks, of the cold weather, he felt himself becoming gradually weaker. He noticed that after any exertion, such as walking up-stairs, he became short of breath, recovering rapidly, however, on resting. Finding, as time went on, that his condition was becoming aggravated, he sought medical advice, and was advised to come into the Infirmary.

State on Admission.—Patient looks a fairly well-developed man. His height is five feet eight inches, and weight nine stones three and a half pounds, nearly two stones, he tells us, less than his usual. His muscles are soft, and his skin has a slightly lemon-yellow color. His temperature varies between 98° and 101° F.

Alimentary System.—His lips, gums, and tongue are pale, and

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the latter is slightly furred, and indented with the teeth at the sides. He tells us that his appetite and digestion have been fairly good until within the last two months. His bowels are slightly constipated. On physical examination the liver is found to be of its normal size.

Hæmopoietic System.—No enlargement of lymphatic glands or spleen can be made out. Examination of the blood reveals that the red corpuscles are reduced to two million two hundred thousand, and the hæmoglobin to twenty-two per cent. Poikilocytosis is not well marked, but there are a few small red corpuscles, microcytes, and some tailed corpuscles. There are also a few nucleated red corpuscles, and the blood-plates are slightly decreased in number. The number of white corpuscles appears fairly normal, and the specific gravity of the blood, ascertained by Roy's method, is under 1050.

Circulatory System.—He complains of shortness of breath and palpitation on exertion, and states that he has occasionally become giddy and felt faint. Physical examination reveals slight enlargement of the left ventricle, and systolic murmurs (hæmic) at the mitral and pulmonary areas. There is also a *bruit de diable* in the veins of the neck. His pulse-rate varies between 80 and 90, and his pulse-tension is distinctly low.

His respiratory system is practically normal, and as regards the integumentary system all that need be said is that his skin has the lemon-yellow color to a slight extent, and that for some weeks past he has noticed a little œdema of the ankles at night.

Urinary System.—The quantity of urine is about forty ounces. It is clear, of a dark-amber color, an acid reaction, and a specific gravity of 1015. It contains neither blood nor albumen, but by means of the spectroscope the presence of urobilin is distinctly made out. His nervous system is practically normal, his sight is good, and with the ophthalmoscope no hemorrhages or other abnormalities in the fundus can be detected. Lastly, he has never had to complain of any pains about the bones. This, then, is a case of pernicious anæmia, a disease in which the blood changes are believed to be primary or essential, as in chlorosis, but which differs from chlorosis in the tendency of those blood changes to be much more markedly developed, and to go on more or less uninterruptedly from bad to worse. Attempts have been made to clearly differentiate this so-called pernicious anæmia from other forms of anæmia. Thus, for example, it has been distinguished from chlorosis not only on account

of its greater degree, of its unfavorable course, of its occurrence at later ages, and of its being as common in males as in females, but also on pathological grounds. Thus, as you know, it is said that the microscopic and other changes in the blood in pernicious anæmia quite distinguish it from chlorosis; that in pernicious anæmia the diminution is in the corpuscles rather than in the hæmoglobin; that the changes in the size and shape of the red corpuscles (poikilocytosis) are characteristic; and that, while in pernicious anæmia there is evidence of excessive breaking down of the red corpuscles (histolysis), in chlorosis there is evidence rather of their defective formation (histogenesis).

Then much has been done also in the way of differentiating pernicious anæmia as an idiopathic affection. In malignant disease of the stomach and, indeed, in many other forms of malignant disease, an anæmia, presenting very much the appearances of pernicious anæmia, is often met with, and I show you now a patient at present under treatment in our wards for stomach cancer who illustrates this. You can see that he is profoundly anæmic, and not only is he pale, but he presents a lemon-yellow tint of skin very markedly. An examination of his blood shows the red corpuscles to be two million five hundred thousand and the hæmoglobin thirty per cent., and shows also marked variations in the shape and size of the red corpuscles. Indeed, I have no hesitation in saying that if we had not found a distinct tumor in the epigastrium we might readily have called this a case of pernicious anæmia.

Next we know that, as the result of continued great losses of blood, an anæmia very similar to pernicious anæmia may be occasioned. The anæmia which attacked the workmen at the St. Gothard tunnel was supposed to be a pernicious anæmia, until the leech-like intestinal parasite, the sclerostonum, was discovered. Further, the examination of the blood in cases of anæmia induced by long-continued bleeding shows it to be very similar to the blood of pernicious anæmia, not only in the diminution of blood-corpuscles and hæmoglobin, but in the poikilocytosis, and even in the presence of nucleated red blood-corpuscles. With this it is interesting to remember that again and again we meet with real cases of pernicious anæmia in which repeated bleedings from hemorrhoids or uterine fibroids have been the cause.

From chlorosis pernicious anæmia has been said, as already stated,

to be distinguished not only by its occurrence at a later age and in males as well as in females, but by the greater relative diminution in corpuscles than in hæmoglobin, and by other blood changes. Yet there is no doubt that this distinction is not clear. In certain cases of pernicious anæmia the relative hæmoglobin diminution is as marked as in chlorosis, and in severe cases of chlorosis poikilocytosis and irregularity in the shape of the corpuscles is as marked as in many cases of pernicious anæmia.

Lastly, a point which has been regarded as of great importance, in connection with the distinction of pernicious anæmia from other diseases, is the deposition of iron in the liver, but an examination of the liver in cases other than pernicious anæmia shows, as Stockman has pointed out, that pernicious anæmia is not the only affection in which excessive amounts of iron are found in that organ, and that the quantity of iron found in the liver is not greater in it than in some other diseases.

The conclusion, therefore, which I would like you to draw from all this is, that while a certain weight must be attached to the theory that pernicious anæmia is a disease of itself in which the red corpuscles are broken down with excessive rapidity in the liver as the result of a ptomaine carried to the liver by the portal system, yet that it may with justice be regarded rather as a symptom than as a disease. Any conditions which tend to impair the nutritive power of the blood may bring it on. The blood is a tissue which, like every other tissue of the body, is endowed at the beginning of life with a store of vital energy which will enable it to live for a certain number of years. Whatever, therefore, tends to exhaust this store before its time must tend to bring on this disease. Thus the faulty conditions which induce chlorosis may bring it on, and a chlorosis may pass into it; irritative and atrophic changes in the mucous membrane of the stomach or intestine may act as its cause, certain cancers may possibly have the same effect; malarial conditions, bleedings of any kind, excessive work or worry, may all lead to its occurrence. Probably as a morbid condition it is much more common than it seems to be. In young people, or in slighter degrees, it no doubt occurs frequently, but, owing to prompt recovery or treatment, it passes unrecognized. It is probably true of it, as of phthisis, that as a disease it appears much more formidable than it really is, because it

is mainly the more advanced and therefore less curable cases that excite our notice.

Let us now revert to our patient's case. As regards its etiology in our patient, we are met with the usual obscurity. But it seems to me that the factor which has been of the greatest importance in this respect is the long-continued bleedings from piles. These bleedings, it is true, occurred many years ago, but they must certainly have strained to the utmost the nutritive power of his blood-forming tissues. At the time he was, of course, much younger, and his compensatory power was great, so that he did not seem much the worse. Now, however, when he is fifty-three, the strain has begun to tell.

As regards symptoms, he has those ordinarily found in this disease. It is to be remarked that the disease came on insidiously, with weakness and shortness of breath. There has been loss of flesh, but yet there has remained, as you see, a fair amount of adipose tissue. The explanation of this is that in spite of the lowered nutrition, the lessened "oxygen-carrying" power of his blood has had as its associate diminished metabolism, and has left much of his adipose tissue unused. A certain amount of fever is to be recognized in his case, his pulse is quickened, and his temperature rises occasionally to 100° or even 101° F. He has never presented any tenderness over the bones, as the sternum, ribs, tibia, a common symptom in pernicious anæmia, nor has he any blood extravasations into the retina, but his skin has the lemon-yellow tint, and his urine gives markedly with the spectroscope the reaction of urobilin. This urobilin reaction is worth remembering, for, indeed, by means of the spectroscope, we can often pick out the urines of a pernicious anæmia case from any other urines in the ward.

The prognosis in pernicious anæmia is not at all good, and this you will best understand when I tell you that out of twenty-four cases of this disease to the notes of which I have had access, no less than twelve died, five were stated to have gone out unchanged, and seven were said to have recovered. Moreover, of those who were said to have been discharged *in statu quo*, or recovered, subsequent records show that three were readmitted within a year or two afterwards, and that of those three, two have since died.

It may be asked here, Does age affect the prognosis? From what has been stated on the subject of the etiology of the disease, that is to say, looking upon the disease as indicating an exhaustion of the

nutritive power of the blood tissue, it might be surmised that the older the patient the worse would be the prognosis. But an examination of those twenty-four cases shows that other factors must be more important, for, although the two oldest of the cases, aged fifty-seven and sixty-four respectively, died, there were many deaths between the ages of forty and fifty, and the youngest case of all, that of a lad of twenty-two, presented a very rapid course, and terminated fatally.

Next, it may be asked, Is the degree of anæmia of importance prognostically? Here it may be stated that a diminution in the corpuscles to about five hundred thousand, or of the hæmoglobin to ten per cent., was met with only in fatal cases. But I find that among those twenty-four patients, one who recovered had on his admission only one million two hundred and forty-five thousand corpuscles, and twenty-two per cent. hæmoglobin, and one who died had on his admission two million eight hundred thousand corpuscles and forty per cent. hæmoglobin.

As regards the other characters presented by the blood, the poikilocytosis, the presence of nucleated red corpuscles, the presence of blood-plates, etc., it cannot definitely be said what special prognostic significations they present.

Still, on this subject we have some information which is worth remembering. In the first place, it would seem to be the case that the poikilocytosis is not always proportional to the severity of the anæmia. Indeed, it has been noticed that the poikilocytes have become distinctly less numerous before the death of the patient.

Much the same may be said as regards the nucleated red corpuscles, for they also have been noticed to diminish as the case progressed to a fatal termination.

The blood-plates, which are ordinarily scanty in pernicious anæmia, seem to behave differently, for when improvement occurs, they tend to increase, and it would seem as if their increase might take place more rapidly even than that of the red corpuscles.

As regards the leucocytes, it does not seem to be known whether or not they offer any prognostic signification. In this disease they are usually diminished in number, and this diminution affects mainly the large multinuclear ones, so that the small leucocytes preponderate.

Finally, from the point of view of prognosis, it would seem that a tendency to hemorrhage is bad. Out of the twenty-four cases, five

were noticed to have retinal hemorrhages, and they all terminated fatally.

Lastly, as regards treatment in pernicious anæmia. In severe cases we always advise absolute rest in bed and a diet as nourishing and digestible as can be procured. As regards drugs, we give arsenic. We generally begin with doses of three or four minims of the liquor arsenici hydrochlorici thrice daily, increasing it every few days till the patient takes it in doses of twenty or twenty-five minims thrice daily. With the arsenic we sometimes combine iron, preferably the protochloride of iron, and certain of our cases have been benefited by phosphorus. On the theory that the disease is to be ascribed to the development of a ptomaine in the intestinal canal, and its resorption by the portal system, germicide remedies, like beta-naphthol or salol, may be used, but whether those drugs are used or not we are mindful to guard the patient against constipation. We have made use also in certain cases of oxygen inhalation for periods of fifteen or twenty minutes several times daily. This was recommended long ago by Trousseau, and it has seemed occasionally in our hands to have been beneficial.

Next, let me say a little as regards transfusion of human blood. There is no doubt that the transfusion of a few ounces of blood from a healthy individual into the circulation of a patient with pernicious anæmia has been of most marked benefit. The best example of this which I have ever seen was in a case of Dr. Affleck's. The patient was a man aged about fifty, who had the disease in an extreme degree. Other plans of treatment had been employed without effect, and the patient was so blanched and feeble that the question of transfusion was considered in the light more of a forlorn hope than of anything else. His corpuscles were reduced to nine hundred and seventy thousand, and the hæmoglobin to seventeen per cent. Owing to difficulties in the practical part of the operation, only some four ounces of blood were transfused. The patient had a rigor and fever two hours after the operation, but next day he felt better, and he eventually recovered and was discharged. And now let me say a little as regards the benefit which one undoubtedly obtains in certain cases from transfusion. That it is due to the corpuscles transfused one cannot, I think, believe. They are probably soon broken down and eliminated. More likely is it that the serum of healthy blood contains a substance which antagonizes or destroys the poison of per-

nicious anæmia, whatever that may be, which acts, indeed, like an antitoxin. Further it is to be noticed that after transfusions the occurrence of rigors and fever has often been remarked. Now, although such an occurrence might indicate that in the operation antiseptic precautions had not been properly observed, the fact that some of the most successful instances of transfusion have been followed in a few hours by rigors and rise of temperature might be interpreted as indicating a reaction somewhat similar to what one gets with tuberculin. This also points to the beneficial effects of transfusion in this disease being due to some constituent of the serum. Bearing in mind this explanation of the effects of transfusion, we can easily understand the *rationale* of such procedures as the subcutaneous injection of human blood, as recommended by von Ziemssen. This is done by injecting under the skin—all antiseptic precautions being observed—fifty cubic centimetres of defibrinated human blood, divided into two parts, twenty-five cubic centimetres being injected into each thigh. The point of injection is vigorously rubbed, and thus the injected blood is forced into the lymph-channels. A plan which I have followed in several instances has been the injection hypodermically of quantities of human blood serum. This involves a procedure much less difficult and complex than transfusion, and I have certainly seen beneficial results follow from it. With transfusions or with hypodermic injections of blood or blood serum it should be remembered that a single application may not be sufficient, so that we should be prepared to repeat the treatment if necessary. From what has been said in explanation of the beneficial effects of transfusion or hypodermic injection of blood or blood serum, it will easily be understood that bone-marrow feeding or the hypodermic injection of the beef marrow and spleen juice, are procedures well worthy of trial. Indeed, in the wards, we usually begin treatment by one or other, or both of these latter, along with the administration of arsenic.

MUSCLE-FAILURE OF THE HEART DUE TO CHRONIC ALCOHOLISM.

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GENTLEMEN,—In this lecture I intend to call your attention to a variety of muscle-failure of the heart that results from the habit of excessive indulgence in alcoholic drinks, especially malt liquors. The fact of this habit inducing a depraved nutrition of various organs, and especially of the liver, was long ago recognized, but I confess that when in 1878 or 1879 I heard Sir William Roberts ascribe to it muscle-failure of the heart, I was sceptical, notwithstanding my profound respect for his authority. I was then resident medical officer in the Manchester Royal Infirmary, and enjoyed unusual opportunities for observation, but a considerable time elapsed before I became fully convinced of the existence of the variety of cardiac muscle-failure that forms our subject to-day.

A type of heart-disease may be best described by considering in the first place the symptoms, and in the second place the signs it presents. When we have considered these clinical features presented by it, the history and antecedents have to be carefully inquired into. I will adopt so far this arrangement and apply myself to describe to you first of all the *symptoms* presented by cases of alcoholic heart-failure. A glance at the neck of most sufferers from heart-disease will reveal abnormal visibleness of pulsation,—either the arteries pulsate in an abnormally visible manner, or the veins are seen to pulsate. In most cases the venous pulse can be readily distinguished from the arterial by its being undulatory, or, as it were, double,— an appearance readily explained by reference to a tracing taken from the vein by the phlebograph. If there be any doubt, slight

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manipulation will enable us at once to distinguish between the two pulsations. It is only in cases of an extreme degree of failure of the right side of the heart that the venous pulse becomes a single impulse coincident with the ventricular systole, the auricle having become practically a passive reservoir. Venous pulse, or exaggerated arterial pulse, will be seen in the neck of almost every sufferer from alcoholic failure of the heart, the exceptions to this rule being explicable generally by the short neck and well-covered vessels of the individuals presenting them. The three great cardinal symptoms of heart-failure are usually well represented in the cases of alcoholism we are considering: these are *dyspnœa, dropsy*, and an *enlarged tender liver*.

1. *Dyspnœa* is usually the first symptom to be developed, and when it is not noticed before dropsy has supervened the patient's observation is to be suspected. There cannot be heart-failure and good "wind;" the two conditions are incompatible. It is astonishing how little heed some individuals give to their body-functions, and when it is alleged that dyspnœa did not precede dropsy, an error of observation or memory on the part of the patient is almost certain. The breathlessness occurs first of all on exertion only, later all exercise induces it, and finally dyspnœa is hardly ever absent, or there are nocturnal paroxysms of it coming on when the patient is at rest in bed. Of course, late in the case many secondary causes of dyspnœa are apt to arise, such as pleural effusion and œdema of the lung. I am not aware that the dyspnœa of alcoholic heart-failure presents any distinctive features from the dyspnœa of heart-failure in general. I have not myself noticed Cheyne-Stokes respiration, and this peculiar form of dyspnœa is certainly most often associated with the muscle-failure of chronic Bright's disease, whether or not it ever occur in alcoholic muscle-failure.

2. If the dyspnœa of alcoholic heart-failure does not offer any distinguishing features from the dyspnœa of heart-failure in general, the same can hardly be said with reference to the *dropsy*. Nevertheless, the difference is hardly one of kind, but rather of degree, and concerns essentially the distribution of the dropsy. Wide distribution and caprice of localization seem to be the two great features of the dropsy of alcoholic heart-failure. It has long been recognized that there is, even in the dropsies that are associated with heart-disease, a "peripheral element," and this element would seem to be

specially pronounced in the case of the dropsy we are considering. The subject of dropsy in general it would be out of place to discuss here, even were our knowledge of it ripe for discussion, which I do not think it is. To put the case shortly, it may be said that the dropsy of alcoholic heart-failure resembles the dropsy of Bright's disease to a much greater degree than do most heart dropsies. The upper extremities are often involved, the surface of the trunk almost invariably so in severe cases, and the scrotum frequently. One of the first cases to impress upon my mind the remarkable seeming caprice in distribution of the dropsy of alcoholic heart-failure was that of a man who came to the Manchester Royal Infirmary while I was in charge of the out-patient department. He came, having as his chief symptom œdematous swelling of his scrotum, and presented only the merest trace of pitting over his tibiæ. There were no indications of any local inflammatory condition, and no urinary trouble. He was a plethoric, vigorous-looking man, whose aspect was far from being suggestive of Bright's disease. Although he admitted being breathless on exertion, this was not the cause of his seeking advice. It was the swelling of the scrotum that had caused him to do so. At the time I attached less importance to the appearance of visible pulsation in the neck as a sign of disturbance of the circulation than I now do, and I have no recollection of its presence or absence,—doubtless it was present. There was no murmur to be heard over the heart, and, being aware at that time of the occasional caprice of the dropsy of Bright's disease, I obtained a specimen of the patient's urine, only, however, to find it concentrated and free from albumen. I have since often felt grateful that it contained no albumen, knowing, as I do, how common as a subordinate symptom of alcoholic cardiac failure albuminuria is. Had this patient's urine contained albumen, I should have considered that my diagnosis of Bright's disease had been confirmed, and lost a precious lesson thereby. Even in acute Bright's disease, and in the absence of any œdema of the lung, or pleural or pericardial effusion, a certain amount of dyspnœa on exertion is, I think, rather the rule than the exception, and I have attempted to explain it by the rise in arterial pressure the disease usually induces. Among curious and irregular distributions of dropsy I have witnessed in alcoholic heart-failure may be mentioned great swelling of the upper part of the thorax, neck, and arms, while the legs hardly "pitted" at all, so that the

dropsy resembled the dropsy due to a mediastinal tumor; huge pads or "cushions" of œdema on the back, and special accumulation of œdema over the sternum, so that the finger could be depressed nearly an inch deep into the œdematous tissues. This last distribution of dropsy has more than once suggested to me the nature of the case. Sometimes œdema is found only over the sacrum, but this happens also in non-alcoholic cases,—at least, in cases associated with damaged valves. The face and eyelids, as a rule, escape, but several patients have described to me such swelling as having occurred before they came under observation.

The œdematous tissues are sometimes tender, but the same tenderness occurs in other varieties of heart-disease, although I am inclined to think, more frequently in alcoholic cases. I do not of course refer to *deep* tenderness, such as is met with when the muscles of the calf of the leg are grasped in peripheral neuritis.

Dropsy occurs into the serous sacs as in other heart cases. It is curious to note, however, that the abdominal walls may be very œdematous, while there is little or no ascites. Inflammation of the serous sacs as pleurisy with effusion is met with from time to time, but not more commonly than in ordinary heart cases.

3. We have next to consider the third cardinal symptom of heart-disease as it is represented in the heart-failure that results from alcoholism. *Enlargement of the liver* is almost invariably present in all varieties of heart-disease as soon as the circulation becomes seriously disturbed. Moreover, the enlarged liver, under the circumstances, is as invariably tender on pressure, such tenderness being apparently associated with stretching and tension of the capsule and not with any degree of inflammatory action. Both the enlargement and the tenderness may be repeatedly observed to develop and recede in the same case in accordance with the state of the circulation. Stokes long ago called attention to these facts in the following words, referring to an exacerbation of the disturbance of the circulation in a heart case: "It is under these circumstances that the already enlarged liver exhibits a rapid increase of tumefaction, in a few hours descending far into the abdomen, yet, on the subsidence of the attack, returning to its ordinary volume, when it may be felt as a flat indolent tumor extending from an inch or more below the false ribs." He adds, "Andral has noticed this singular augmentation of the liver, which is often as remarkable and recognizable as

that of the enlargement of the spleen in ague." Dr. Lauder Brunton recently called attention to the same phenomena from the physiological side.

The peculiar tenderness on pressure, associated with passive congestion of the liver, has no doubt contributed to enlarged livers really resulting from the venous stasis of a disturbed general circulation being regarded as examples of more or less early interstitial hepatitis. No doubt the two conditions may be combined. As a rule, however, the passive congestion is readily distinguished from the active by the rapid subsidence of the volume of the liver and the tenderness on restoration of the circulation. I have often hastily concluded that an alcoholic subject suffering from cardiac failure was also suffering from interstitial hepatitis until the rapid subsidence of the liver tumor, as the circulation returned to the normal, demonstrated to me that the essential condition present was passive and not active congestion or its later results. The passively congested liver offers greater resistance to palpation than the normal organ, and is thus apt to give the observer the impression of a certain degree of induration having taken place. In some cases in which genuine interstitial hepatitis (cirrhosis) is present, enlargement of the spleen will afford a strong indication of the existence of hepatitis, for it is common when the source of the disturbed portal circulation is the liver, and comparatively rare in simple heart cases. Infarcts in the spleen in these last may enlarge the organ, and in septic endocarditis the spleen becomes enlarged by a process other than obstructed return of venous blood and analogous to that met with in the zymotic diseases. In ordinary heart cases the spleen would seem to be spared great venous engorgement and consequent enlargement by virtue of the ready distensibility of the liver, which thus, as it were, interposes itself between the seat of obstruction and the spleen and by its own ready yielding before the increased venous pressure prevents the latter organ becoming appreciably enlarged.

The various symptoms that depend upon the disturbed circulation in heart cases in general occur with little or no modification in alcoholic cases, and it is useless to discuss them in detail. Owing, however, to the resemblance of the dropsy of the latter cases to the dropsy of Bright's disease, albuminuria requires some reference. Albuminuria is so common in ordinary heart cases that it is difficult to prove that it is more common in cases of the cardiac muscle-failure

of alcoholism. If it be so, the difference between the two sets of cases in this respect is not great, and only such as may be theoretically believed likely to occur in the presence of the tendency to degeneration of tissues that is so common in alcoholic subjects, the kidney not being entirely exempt.

Embolisms in various organs—especially the lungs, giving rise to hæmoptysis—occur in cases of alcoholic heart-failure just in the same way as they do in other varieties of muscle-failure and consequent dilatation of the chambers of the heart, the source of the emboli being of course particles of fibrin deposited in the recesses of the chamber-walls. They are therefore of bad prognosis.

We have now to consider the physical signs of the cardiac failure that results from alcoholism. I have already described among the symptoms the abnormal visibleness of pulsation in the neck and the enlargement of the liver that are seldom absent in this as in other varieties of heart-failure, though these conditions are, strictly speaking, signs rather than symptoms. The convenience of this arrangement is obvious: while we are listening to the patient's narration of his symptoms we naturally glance at his neck, and as he tells us of pain or uneasy sensation in the right hypochondrium we as naturally place our hand over the region referred to, ascertaining not only the enlargement of the organ, but its tenderness.

Examining the heart in the ordinary methodical way, it is common on *inspection* to notice epigastric impulse,—the diffuse impulse of the right ventricle,—and to detect a too extensive and displaced apex-beat,—the impulse of the left ventricle. This latter indication is, of course, most likely to be met with in cases of long standing, after a series of break-downs that have been recovered from, hypertrophy being well developed. *Palpation* affords still more precise information of the degree of vigor of the right and left ventricles respectively, while confirming the observations already made by inspection as to the extent and situation of the apex-beat. *Percussion* informs us with a fair amount of accuracy as to the all-important matter, the size of the heart, an indication of which will probably have been obtained from the preceding physical methods of diagnosis. In the great majority of cases some enlargement of the heart is ascertained when the patient comes under observation. Occasionally a case is seen early in the disease, and before appreciable dilatation of the cardiac chambers has been established, but this hap-

pens only exceptionally. It must be borne in mind, however, that the percussion of the heart is by no means a perfect method of ascertaining the size of the organ, and emphysematous lungs, or a distended tympanitic stomach or colon, may render it practically useless. Extension of cardiac dulness may occur in all three directions, —upward (infundibulum of R. V.), to the right (R. A.), and to the left (L. V.). In the first direction, extension of dulness is rare in alcoholic cases, while to the right and to the left it is the rule. (Of course, it is assumed that hydropericardium is absent.)

Auscultation.—It is a matter of great importance to recognize the fact that there may be no murmur to be heard over the heart in cases of its failure as the result of alcoholism. Nevertheless, it very seldom or never happens that the heart sounds can be pronounced to be normal. The modifications of the natural heart sounds (as distinguished from murmurs) that occur are numerous and often difficult to define and describe. To the practised ear, however, the sounds usually present some abnormal feature. As one might suppose, the pulmonary second sound is, as a rule, more or less accentuated as the result of increased blood-pressure within the pulmonary artery. Accentuation of the aortic second sound may be present owing to there being some dilatation of an atheromatous aorta, although this condition can hardly be attributed directly to the alcoholism. A very important modification of the second sound is reduplication in the peculiar form of triple rhythm in the cardiac sounds that constitutes the *bruit de galop* of French writers. Although the double diastolic sound of this combination is usually regarded as in essence the physiological second sound of the heart, and as due to the separate closure of the two sets of semilunar valves, there is some doubt as to its really representing the physiological *second* sound at all. Occasionally the double diastolic sound of the *bruit de galop* is accompanied by a double shock, easily felt on placing the hand over the apex-beat. Heuchard called attention to this "sensation tactile," and regarded it as more common than the corresponding "sensation auditive." The *bruit de galop* is of course in no way peculiar to the cardiac muscle-failure of alcoholism, and is common practically to all varieties of heart-disease, inasmuch as muscle-failure is common to all of them sooner or later. The first sound of the heart may present various modifications, such as loss

of tone, shortening, assumption of a peculiar "clang," and redupli-
cation.

In a large number of cases, as already stated, the modifications
of the sounds that indicate a departure from the normal are slight
and extremely difficult to define usefully.   This statement applies
specially to the first sound, into the production of which a "muscle"
element is generally admitted by the holders of even different
theories as to its causation.   We have as yet considered modifications
of the heart sounds apart from the production of murmur.   It can-
not be too strongly emphasized that alcoholic heart-failure, with all
its most characteristic symptoms, may be fully developed without
there being any murmur to be heard over the heart.   This fact has
led some to look for a cause of the remarkable dropsy that is charac-
teristic of the disease elsewhere than in the heart.   We have ad-
mitted a "peripheral element" in the production of this dropsy, as
we do in that of all dropsies, and we are willing to grant that such
"element" is in greater force in this form of cardiac dropsy than in
others, with the exception, perhaps, of that associated with Bright's
disease and possibly of that met with in certain anæmias.   But that
the heart is the essential factor in the causation of the dropsy we
hold most strongly, and when we are asked for proof of our belief
we have no difficulty in obtaining evidence that in our thinking ad-
mits of no gainsaying.   We have only to point to the early establish-
ment of dyspnœa, that unmistakably bears the features of a cardiac
dyspnœa, to the as early development of abnormal visibleness of
pulsation in the neck, arterial and venous, and to the enlarged and
tender liver that we know to associate with the condition of venous
stasis.   It may be urged that we have taken an active congestion for
a passive one in the liver, but we have only to remind the caviller
that the enlargement and tenderness of the liver rapidly subside on
the general circulation being restored, *exactly* as they do in the most
ordinary valve case of heart-disease, endocarditic or aortic in origin.
The tenderness of the liver is no more marked in alcoholic than in
rheumatic cases of heart-disease, and, no doubt, depends on tension
of the capsule, and is entirely independent of active congestion,—
i.e., the first stage of inflammatory action.   There is no difficulty in
recognizing the evidence of cardiac failure without the existence of
murmur.   For the moment, let us look away from alcoholic cases
and ask ourselves if we refuse to recognize heart-failure without

murmur in advanced Bright's disease when the patient has orthop-
nœa without thoracic effusion or lung implication to explain it, when
his neck shows marked venous pulsation and exaggerated arterial
pulsation, and when we can feel his more or less tender liver a couple
of inches or so below the costal margin in the mammary line?   Were
we to refuse to recognize cardiac failure without murmur produc-
tion, we should wilfully ignore it in a very large number of cases
of which the only hopeful treatment is that of the heart.   The po-
sition is too untenable to be seriously considered.

The majority of cases of cardiac failure the result of alcoholism,
as a rule, present systolic murmur in one or other area in the pre-
cordial region, but such development of murmur may be only tem-
porary and transient.   The most characteristic murmurs are those
of mitral and tricuspid incompetence.   A murmur over the pul-
monary area is also common, and may be the only murmur or the
loudest murmur present.   It is by no means uncommon to hear a
murmur in the aortic area, too, when a murmur is well developed in
other areas.   Of course it has to be borne in mind that an aortic
systolic murmur may be due to slight degenerative changes in the
aorta and bear no direct relationship to alcoholism.   I remember
such a case in a subject of alcoholic cirrhosis of the liver in which a
murmur due to atheromatous change occurred quite irrespectively
of muscle-failure of the heart and of any cardiac symptom.   The
murmur in the pulmonary area is probably of the same nature as the
notoriously common murmur of the cardiac muscle-failure of the
anæmic.   Its production and relationship to the murmur of mitral
regurgitation are matters that it would be out of place here to dis-
cuss.   Suffice it to note, that a systolic murmur is not uncommon in
this region, and, further, that it may be the only murmur present.
The murmur of tricuspid incompetence may be considered a sec-
ondary occurrence, secondary in importance and in development.
It does not differ from the systolic tricuspid murmur so frequently
met with in all kinds of heart-disease.   The first sound is commonly
audible along with the murmur, but sometimes the murmur entirely
replaces it.   The murmur of mitral incompetence presents the char-
acteristic features of like murmur developed in primary muscle-
failure in general; that is to say, it is usually preceded by the first
sound of the heart at the apex and is absent at the back, the first
sound of the heart being alone audible there.   In cases in which we

may presume that there is unusually free regurgitation, the first sound may be absent at the apex and at the back, the murmur being present in both situations. As recovery takes place in such a case, it will often be noticed that the first sound is re-established first of all at the back and later at the apex. In both of these situations the sound becomes audible accompanied by the murmur, though ultimately the latter may disappear, leaving the physiological sound.

The pulse tension in cases of alcoholic heart-failure is usually reduced; probably the change is always in this direction. If the patient, however, is seen in an early stage of the disease the pulse tension may be normal. (Fig. 1.) It is not unlikely that in cases of the kind the habitual pulse tension of the individual was higher

FIG. 1.
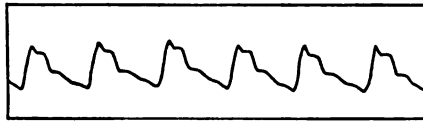
Normal pulse tension.

FIG. 2.

Hyperdicrotism occasionally seen in advanced cases.

FIG. 3.
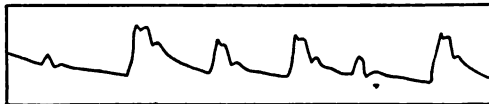
Combination of pulse beats of high and low tension.

than normal. In advanced cases, extremely low tension is the rule. Hyperdicrotism is thus occasionally developed. (Fig. 2.) A wide range of pulse tension is met with, and between the extreme degrees of low and high tension that occur a form of irregularity is occasionally developed, of which the characteristic feature may be said to be a combination of pulse-beats of low and high tension. (Fig. 3.) All the characters of the pulse are best studied by reference to sphygmograms. As regards the tension of the pulse, the points to be specially

noticed in the sphygmogram are the presence and degree of develop-
ment of the tidal wave, which is altogether absent in low degrees
of tension, and the distance of the aortic or dicrotic notch from the
"respiratory line" (a line drawn through the bases of the upstrokes).
When this notch falls below the respiratory line the pulse is said to
be "hyperdicrotic," and this condition denotes an extremely low
degree of pulse tension. (Fig. 2.) One of the chief uses of the
sphygmograph is to enable us to follow the progress of convales-
cence and to estimate the danger in unfavorable cases. In these
last the tension usually steadily falls (Figs. 4 and 5), while con-
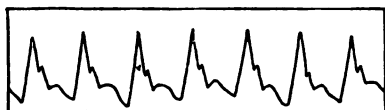
FIG. 4.   FIG. 5.
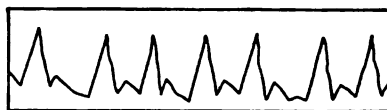
Steady fall of tension seen in unfavorable cases.

valescence is indicated by a steady rise in the same.   (Figs. 6, 7, 8,
9, and 10.)   The transition from low to high tension may be made
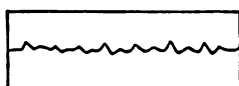
FIG. 6.   FIG. 7.

Steady rise of tension seen in favorable cases.

FIG. 8.

Steady rise of tension seen in favorable cases, showing abortive condition of left ventricle.
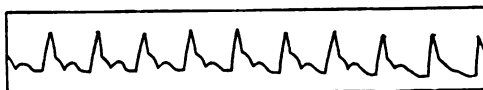
FIG. 9.   FIG. 10.
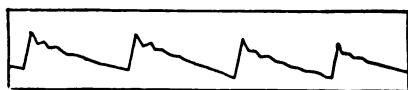
Steady rise of tension seen in favorable cases.

gradually, without the occurrence of any irregularity of the pulse.
On the other hand, the pulse in the transition stage, as stated, may
show irregularity, some of the individual curves being of fairly good
tension and others of low tension, and evidently indicative of an

abortive contraction of the left ventricle (Fig. 8), the proportion
of the two kinds of curve and the order in which they occur varying
in different cases. In all the characters last referred to, no dis-
tinguishing feature between the pulse in mitral stenosis and in alco-
holic muscle-failure is to be recognized, a matter of some importance
when it is remembered how frequently it happens that in the former
lesion exactly similar auscultatory signs may be met with; that is
to say, there may be either an absence of murmur or an apex systolic
murmur accompanied by the first sound, which latter is alone audible
in the region of the angle of the scapula. Apart from the circum-
stance that irregularity of the pulse is much less common in alco-
holic cases, the history and circumstances of the case will usually
suffice for the diagnosis. Tachycardia is not very rare in alcoholic
muscle-failure of the heart. (Figs. 11 and 12.) A bigeminal pulse is

Fig. 11.

Fig. 12.

Tachycardia.

Fig. 18.

Bigeminal pulse.

Fig. 14.
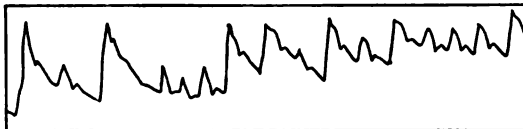
Extreme irregularity or delirium cordis.

comparatively common, but is generally due to the influence of digi-
talis. (Fig. 13.) The influence of this drug at any rate cannot be
eliminated from the result. Now and again an extreme degree of
irregularity of the pulse is observed, due to a veritable "delirium
cordis." (Fig. 14.)

The *prognosis* of alcoholic heart-failure in its earlier stages is surprisingly good, provided the habit be abandoned; and even though it be persisted in, a series of cardiac "break-downs," each followed by a progressively less satisfactory recovery, usually precede the end. The degree of cardiac dilatation reached may ultimately be very great, and this, too, in cases without murmur. Albuminuria is present at one time or another in most cases. It is most commonly the result of venous stasis only, but in a few cases nephritic or degenerative changes occur in the kidney structure, and the albuminuria is persistent. Numerous casts and the presence of blood in the urine point to nephritis, which is of evil omen, but hæmaturia, usually of short duration, may result from renal embolism.

Diagnosis.—We have just commented on the frequency of albuminuria in cases of alcoholic heart, and when there is no murmur present, confusion of the disease with Bright's disease is apt to arise. A certain degree of muscle-failure of the heart occurs in the great majority of cases of Bright's disease, and we have a visibly pulsating neck, dyspnœa, and an engorged liver in both diseases, not to speak of the dropsy that has long been held to depend on kidney-disease independently of heart-failure. Such a capriciously and widely distributed dropsy as we are wont to ascribe to a nephritic origin resembles the type of dropsy that occurs in alcoholic heart-failure; in both conditions there is often no cardiac murmur, while albuminuria, invariable in Bright's disease, is common in cases of the alcoholic heart. After all, both conditions bear a close essential similarity, inasmuch as in both there is muscle-failure of the heart with all its attendant symptoms.

The treatment of alcoholic heart-failure differs in no essential respect from the treatment of muscle-failure of the heart in general. Even alcohol is not to be withheld when the patient is dangerously ill. Of the usefulness of alcohol in the treatment of heart-disease of all kinds there can be no question. It was the old "nitrite," relieving the heart by acting as a vaso-dilator. Of course, as soon as the patient is convalescent, his alcohol is to be rapidly diminished, and soon stopped. Then will be the time to impress upon him the risk he will certainly run if he does not accept the warning he has had, and become an abstainer. Half-measures are quite useless. If the habit be abandoned, the prognosis is surprisingly good, so far

as the heart is concerned. Digitalis is the most useful drug, though strophanthus, caffeine, diuretin, etc., will now and again succeed in establishing a diuresis, after digitalis has apparently failed.

An occasional sharp purge is useful when the portal circulation is much congested. Strychnia is a valuable respiratory stimulant and general tonic.

Symptoms as they arise must be treated *secundum artem* in the ordinary way. Great attention should be given to feeding. Important in the treatment of all heart cases, it is specially so in alcoholic cases, for while a patient is taking his food his craving for alcohol is not likely to assert itself. Rest in bed is imperative in all but the mildest cases, and will often by itself determine restoration of the circulation and—that much-to-be-desired condition in all heart cases—the establishment of a diuresis.

Neurology.

THE REPAIR OF WILL-LOSS.

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ciation; Professor of Diseases of Children in the Philadelphia Polyclinic; Assist-
ant Physician to the Infirmary for Nervous Diseases; Consulting Physician
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LECTURE II.

GENTLEMEN,—It would be interesting to trace the various ways
by which the habit or capacity of willing is impaired, following up
only those conditions which are acquired through the ordinary exi-
gencies of life, and leaving out of the account distinct disease of the
mind, or that which stands for it in ordinary language. The power
to initiate thought or act is one which is readily injured in the child.
Take an illustration I have used elsewhere when pointing out the
necessity to cultivate volition in children who through some acci-
dental cause are discouraged, hence lose their recently and partly
acquired faculties, such as stammerers, who, since they fail often in
attempts at articulate speech, are thrown back upon themselves,
rearrange their concepts, try to put them in a different shape, again
fail, and finally become confused in thought, lose spontaneity, are
changed in character, grow timid and shrinking, seem dull, and
altogether fail to develop as their powers should warrant. All this
occurs from lack of a smooth outlet to their instinctive impulses.
Other defects of speech do the same thing, and in my clinics chil-
dren often appear who need to have their mothers and care-takers
instructed how to patiently lead them out of the very serious toils
which their physical inaptitude at articulate expression has led them.
Again, if a partial palsy has occurred in a child or young adult, he,

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too, finds that the arm or leg no longer executes accurately and well what he was able to expect of it aforetime, and the natural tendency is for him to make less and less of effort at dominating the extremity to execute its customary behests. And yet this is the one thing essential not only to restore function (if this be possible), but to even retain what little power for activity remains in the hindered member. The circumstances of the domestic life of many young people is fruitful for harm in discouraging a none too forceful volition, by reason of overbearing folk who assume power and responsibility and dominate the daily acts which should be the privilege of each one to initiate for himself. There are many really able folk thus made to become, or appear feeble, undecided, almost irresponsible. Circumstances of the purely accidental sort either contribute to this or furnish a respite. And when, finally, some tide in affairs calls upon such a person to form important decisions or to struggle out of a series of embarrassing, hampering situations, the needful impulse is found lacking, and not seldom disaster is the result. The particular phase of the matter which invites our attention here is the getting out of the invalid state, into which it may be the fate of any of us to fall some time or other. It is especially difficult for one who is readily discouraged at the best of times to regain vigorous tone of body and mind with all the promptitude which the occasion should warrant. Medical skill, as this is ordinarily understood, will not suffice. The organic activities may be abundantly restored, not that the individual is well and strong,—these are relative terms, —but that the barriers to a fuller and completer restoration to customary health are removed and the way open for competent individual effort and forcefulness, in which the medical adviser can only play a secondary part and has relatively small responsibility. To be sure, his help may be frequently required, provided he recognize the need, and that is the point of my story. To the observing man no prompting is called for, but there is some lack of acuity in the observation of all of us, and a well-directed timely hint now and again may not be amiss. Indeed, it is the common fate of all to let many obvious things pass our sight. Often it is not given physicians to direct beyond a certain point, we being no longer consulted, so it may be no one's fault. However this may be, it is failure or inability to direct the convalescence wherein many physicians fail their worst.

Sleep is often much disturbed in the victims of will-loss and in a variety of ways. It is often shallow and unrefreshing; at times explosive, as shown by sudden starts the results of evil or terrifying dreams. This is largely due to loss of balance between tension and relaxation, a physiological irritability accompanied by more or less tremor (which is an index of imperfect cellular equipoise), and must be met by a variety of measures directed to securing tranquillity. Sleep will come as balance is gained; the milder or more powerful hypnotics, varying in their efficacy from time to time, are frequently altogether valueless. Baths, rubbing, especially the sheet pack, are more efficacious, and perhaps the best is the "lightning douche,"— a bucket of cold water thrown with skill directly upon the chest by an attendant ten or twelve feet away. Sleep must be secured early in the treatment, by one means or another, else nutritional gain will be slow or absent. The over-apprehensive patient suffers inordinately, especially when the habit is formed of allowing or encouraging disagreeable thoughts to linger, and night is the time this grows worse. Night wakefulness, it should be remembered, is always more or less like dreaming states, and it is impossible then to cerebrate clearly. Repeated half-waking states is the ground in which insane thoughts grow readily. It is well to constantly teach such sufferers to accept things which worry them, no matter what; to gradually compel their thoughts to other and innocent channels.

A careful consideration of the claims of those who employ hypnotic suggestion will reveal the fact that much imaginative hopefulness clouds their judgment and mars their conclusions. I have used this measure a good deal, and watched the work of others in this country. My conclusions are that it is exceedingly difficult to secure complete hypnosis in America, except among a certain few European immigrants and exceptionally impressionable natives. As to the effects of suggestion, it may be assumed that when one is in an attitude of hope or expectation, and consults an eminent authority who formulates the ideas of which they are vaguely but intently conscious, and when, moreover, one is ready to welcome relief from sufferings or uncertainty, then a valuable impression can be received. If the patient is not conscious of his needs, it is a more troublesome process to implant the impression suggested. If, however, the attitude is one of suspicion or of opposition, it is most difficult, many times impossible, to secure the result attempted, and almost never

unless it can be recognized to have a desirable direction. As Eskridge has pointed out, the impressions must be made sufficiently often to become a habit, and habits are not controlled by doing a thing once; therefore the suggestion must be made several times till the consciousness is moulded in the attitude intended. The desires of the patient once skilfully directed may be reinforced by auto-suggestion and relief obtained in due time, early or late. Persistent argument, demonstrations, pleadings, and dominations will effect quite as much in rational, intelligent folk, and upon this we can more safely rely in the long run.

CASE I.—As an illustration of will perversion in a married couple, loss on the part of the husband, and obstinate yet beautifully consistent invalidism on the part of the wife, I think the following history most instructive. The finality was failure to cure on my part along with several (forty-six) other reputable medical men here and abroad; but my triumph was complete at one point, failure resulting from a final mighty "coup" on the part of the patient recovering control of herself when just on the point of yielding to a cure, which was the last thing she desired.

Mrs. B., a handsome woman of thirty-eight, no children, married fourteen years; husband about five feet high and ninety pounds in weight, very fond and acquiescent, and largely dependent upon Mrs. B. for the sinews of war. Family history only remarkable for selfishness and obstinacy. Never pregnant; only ailments began three years after marriage; a confused history of small-pox, blood-poisoning, diphtheria, and hemorrhagic colitis, which last is supposed to continue till the present. Soon after this concatenation of maladies a sudden fall of forty degrees in temperature and undue exposure brought on a tender condition of the lumbar spine, supposed to be a "meningitis;" was comatose for six weeks; after recovery from this took a rest-cure for a long time, then consulted a leading surgeon in Philadelphia, who pronounced "spinal anæmia;" was frozen on back by ether spray and made profoundly worse; went to sea-shore, —worse; consulted leading physician in Pittsburg, who used cautery on back, etc.,—worse; consulted a leading gynæcologist, who pronounced "fibroid tumor," etc.,—worse; consulted another of greater eminence, who said no fibroid, all rectal trouble, ulcers, fissures, spasm of sphincters, etc.; these were stretched under ether,—no use; cut through,—no use; came to Philadelphia and consulted, sepa-

rately (see how wise), three of the very topmost medical authorities, all at about the same time. No. 1 said "pure hysteria," and promised to cure in three months. No. 2 said "mucous colitis," and prescribed nitrate of silver and a long course of treatment. No. 3 was a surgeon, the unquestioned head of the profession in those days, who pronounced the trouble undoubtedly "spinal" anæmia and hyperæsthesia, with atrophy of two of the intervertebral cartilages; recommended to wear a plaster jacket (which caused spasms), cupping of the spine, etc. This last view met with Mrs. B.'s approval, and a course of treatment was undertaken lasting several months; finally she was given up and told to resign herself to an invalid's life, to be spent in the open air as much as possible. (Letter exhibited.) A trip abroad was thereupon undertaken, and a long list of authorities consulted over there, but the views of none gave satisfaction. Returning to America, New York's leading orthopædist had a trial, and he put on his famous plaster jacket, but this caused "neurasthenia," and the Banning brace gave great comfort for three years (now occasionally used, in journeys, etc., and to appear abroad in). Finally my turn came.

A more timid man would have declined to assume so grave a responsibility, but we must accept fate in whatsoever guise it comes. Here was a past master in all the devices, opinions, views, peculiarities, and weaknesses of forty-six "celebrated" physicians. Pray contemplate the state of mind of one who had learned so much as she, and had such a colossal array of failures to her credit, and judge mercifully of number forty-seven and his efforts. It is needless to recount the results of my examination, which was most conscientious and thorough. In most respects the organs were sound, including the eyes. The chief phenomena were hyperæsthesia of the spinal areas, not to be "suggested" off or on. A touch on the lumbar region caused intense pain, and only twice in the course of treatment could I handle this safely "while lifting to a different position," which necessitated one arm seizing that part,—then the phenomenon was clear. Nutrition, bowels, etc., were in a deplorable state, and systematic rest measures, with all the tact at my command, gradually increased strength and well-being. The bowels ceased to "void blood," due in great measure to the tact of the nurse, who exhibited everything suspicious to me, and in time they came to work normally. By steady suggestions I got her to walk a little, and, finally, when the whole organism

bloomed like a peony, I asked to have a consultation with our first orthopædist, Dr. W., in the hope that we might yet more relieve the "spine." She accepted Dr. W. because she chose to assume that upon him had fallen the mantle of her most trusted adviser (who gave her over as lost to a chronic valetudinarianism). This gentleman examined the spine (and other organs) most carefully, but, at my request, withheld his judgment for two weeks, meanwhile assuring the patient that he found no reason to lessen her systematically increasing activities. She came to walk half a mile with comfort, and finally a mile,—to act in most respects like a sane person. At the second consultation, Dr. W. used much force in stretching and posing, and roundly declared the spine free from all suspicion of fault; also the other organs sound. The rage this woman then exhibited was beyond words. I then "said my say," declaring I had all along known her to be an impostor, but now this was ended forever, etc., etc., most solemnly and forcefully put. For six weeks she seemed cowed, and did act like a rational being, and might have been so yet. In an evil moment the nurse I had employed for her was at a hotel at Atlantic City, and the "lady" overheard her in another room relate her case in full,—all the deceptions she practised, and all my devices and plots to control. The "lady" rushed into the room, confronted the astonished nurse, blazed in fury, fell in a swoon, and at once entered into her present state of triumphant invalidism.

Case II.—This case will illustrate utter failure because of attempts to treat a type of mental disorder at home with only partial isolation.

A young lady whom I had intimately known for years, whose family were charming people, but neither parent accustomed to assume responsibility with any eagerness, possessing all that money could purchase, and in whose immediate family there had been two or three instances of mental disturbances,—some quite severe,— placed herself in my hands. The symptoms were simply those of moderate impairment of functional activity, producing an exaggerated series of discomforts rather than illness, but the whole rendering the patient unable to take her proper place in society. Many physicians had been consulted, some of whom may not have advised wisely, but were not to be altogether blamed, because of her profound disinclination to obey any systematic directions, and because of her obstinate but unclear views as to her own needs.

After a careful *résumé* and consultation with the family (whose attitude was merely eager acquiescence in any suggestions offered, provided the girl herself should agree), I determined to attempt a thorough course of rest treatment and isolation. Every objection was offered to the doing of this elsewhere than at home, therefore we were compelled to use this one imperfect yet only opportunity.

The key-note of the whole matter lay in the fact that this girl had a younger sister, for whom she felt and was endowed with a fierce morbid affection, and whom she kept near her incessantly. Her mental processes were exceedingly unwholesome. With brilliant opportunities and many ornamental qualities, she herself had never been any sort of success in the world. She had no systematic education, had accomplished nothing, and thus became embittered. All of her wholesomer qualities, having turned acid within her because of failing opportunities to develop, were centred upon this younger sister, towards whom she chose to assume the attitude of a parent, an exacting and yet a very indulgent one. Indeed, the girl was a mass of contradictions, whose views of life were lurid and gloomy, but who evinced a most obdurate tendency to dominate the life of her young sister.

This is not an uncommon situation in persons who are relatively failures. Sometimes it is a human being and sometimes it is an animal, but an unhealthy affection which has found no wholesome outlet—the natural object of which is one of the opposite sex—sometimes almost savagely turns to the nearest object upon whom her affections could conveniently centre, and overwhelms that one with a sort of jealous and bitter devotion which seldom results in happiness or good in any direction.

The condition of the patient fully warranted full isolation and relief from this vitiated conception of responsibility, and, could this have been accomplished and her co-operation secured, doubtless she might have become a well and strong, at least an endurable, woman.

In brief, my honest and, I think, wise endeavor to keep these two apart (until such time as was proper for them to come together again) destroyed not only my efforts in her behalf, but has prevented any one accomplishing what I failed to do. The ending was a terrific outbreak of hysterical crying, furious accusations of a really diabolical kind, attempted violence to her nurse, and a deplorable state of affairs. Upon petitioning the family to uphold my authority, they

weakly assured me that, inasmuch as the girl was more than of age and had abundant means, of her own, they could not interfere. I may mention that she is now much as she has been these many dreary years.

CASE III.—The next case will serve to illustrate well the possibilities of restoration to health (always a relative term) of a gentleman endowed with the largest charm of personality and the highest intelligence and attractiveness, who had been relegated to the lumber-heap of broken-down beings. This gentleman is one whom I number among my most esteemed friends, and when I met him first was in the forty-fifth year of his age and had for ten years been a hopeless invalid. The process of his repair was a perpetual pleasure to me.

Upon the origin of his difficulties it is not necessary to dilate. It consisted of a certain amount of financial and other strains, grave anxiety about the health of a parent, and afterwards the serious illness and death of a brother. This gentleman was of a highly sympathetic temperament, and family calamities weighed with unusual heaviness upon his consciousness, and when along with these the necessity obtruded of sticking closely to a rather arduous occupation, the result was a break-down, the phenomena of which had much to do with disturbance of the digestion.

He placed himself in the hands of a spinster-like old doctor, a disciple of Hahnemann, who educated him to regard himself as more than ordinarily hypersensitive to the action of drugs, and for months and years after he came under my direction these old rags of homœopathic knowledge would crop out repeatedly and clog the wheels of rational progress.

Among other things, he found that one-tenth of a drop of sulphuric acid would constipate him so severely that one-tenth of a drop of nux would be needed to loosen his bowels again. Curious sorts of dietetics, too, had been practised. Among other things, he had been taught to eat raw eggs at regular intervals, and the notion dying hardest of all was that he needed a raw egg whenever he felt the least faintness. He used to carry in his pocket a little ornamental box containing a cup which fitted over the end of an egg, and that lay in cotton-wool along with another egg ready for use, and accompanied by a piece of a certain brand of chocolate. One day he and I cast up accounts and found he had eaten, up to that time, eleven

thousand eight hundred raw eggs. After going along in miserable fashion, controlled by these homœopathic ideas, the only effect, so far as I could see, was to confirm him in invalid habits and provide him with the most astonishing scraps of therapeutic belief.

He fell next into the hands of an excellent physician, and this resulted in rational measures so far as dietetics went. He was put to bed, and so gained his first nutritional point (sixty pounds), but he was got upon his feet with difficulty and left to shift for himself. The gain he made was merely a mass of fat-cells jumbled up among the tissues, and so soon as he began to work these melted away like dew before the morning sun, and inside of a couple of months he was down in weight as low as ever.

After this the patient tried various measures, with little or no success, except in acquiring weird and strange conceptions as to the functions and construction of the human body, which will stay by him until death, although they have been immensely modified of late.

Then he came under my control, and his symptoms were too numerous to detail, but consisted of a feeling of inability on his part to go without food beyond a certain limit of time, a pronounced fear of disturbing the action of his bowels, and no confidence in his powers for sustained action. He shared a belief common to hypochondriacs of the necessity of taking numberless rests, lying down upon the slightest occasion. He was unable to sit up in a straight-backed chair for more than twenty minutes at a time, and for no more than ten minutes when he had not a pillow under his neck. He believed that it was impossible for him to endure a ride in any sort of conveyance unless he had a series of pillows supporting various corners of his anatomy, especially the back of his head and small of his back; and also a lot more of queer notions of the same kind.

Organically there was very little amiss. His heart was rather weak. He was subject to terrific headaches, for which he quietly and with saint-like resignation would give up an entire week or two. He had had every kind of glasses tried on his eyes, and had collected about one hundred or more pairs. He wore singularly built clothing, with pads for protecting this or that part, and carried a huge shawl for the purpose of wrapping up any exposed corner.

It took me a fortnight to find out these and numerous other facts bearing either upon his character or his peculiar modes of thought and belief. Despite all of these vagaries, he was, as I have said, a

most attractive personality, and I never approached a task so diffi-
cult nor so pleasant withal.

As soon as I had really made the man's acquaintance I proceeded
to win his confidence, and from that time on led him steadily along
a path which it took three years to travel, but was well worth the
trouble in all ways.

The course, proceeding in this fashion, occupied a great deal of
time, and I was so situated at the beginning of our relationship that I
could take him with me in my carriage in my morning rounds and
talk with him as we drove along. I soon had him sitting upright,
after having shown him what a "figure of fun" he made with feather
pillows under the small of his neck, another at the back, and one
under each knee. He also soon ceased to eat eggs with such insist-
ence, contenting himself with chewing chocolate.

I had a tactful man give him massage and electricity, and soon
got him interested in vigorous activities.

I led him little by little to talk less of his infirm condition, and
to take more interest in external things,—I mean physical things.

It should be mentioned that one characteristic in his existence
was to go out of his way and plan and act for people in no way de-
pendent upon him, to help and encourage them, which he did in an
admirable manner. He and his good wife were childless; they had
some means which enabled them to be independent of daily work,
though far from rich, and they had a host of lame ducks to roost upon
their backs and for whom they were constantly looking out and
nurturing as burdens to be cheerfully borne. They had practically
adopted several young people, who looked upon them as children
look upon parents (and this is often an exceptionally selfish view).
These children of theirs worried them not a little, both morally and
financially, and part of my treatment consisted in showing him
clearly that he must do the best he could for these people and then
close out the matter and cease to worry; that it was altogether wrong
and not in any way helpful to give them too much solicitude and at-
tention.

From the account I have given of this gentleman, the view might
be taken that he was hypochondriacal and selfish. Nothing could be
more removed from the fact. His only thoughts about himself were
to save his seemingly enfeebled activities so that he might economize
them for some good and honest purpose. I deliberately taught him

to be more or less selfish, to take more thought about his own com-
forts, and by comforts I do not mean these little civilized refinements
which had seemed to him such, but the solid comforts that come from
coarse appetites, such as rest after muscular fatigue; the slaking
thirst with simple water when thirst had been earned by the sweat of
the brow. There was a natural timidity in a physical way difficult
to overcome, and part of it was the outcome of his over-refined,
hypersensitive temperament. I managed to make him do little things,
more or less dangerous, and to act more independently. In a month
he had gained much, and at about this time I was going away for a
few days fishing out in the wilds, and took him with me. With much
fear and trembling he went, but it was only his confidence in me and
my care-taking capacity which enabled him to hazard an expedition.

I might mention that this gentleman had a peculiar dislike to a
gun, the result of having seen in his earlier days a shocking and fatal
accident. Now, the use of a gun is neither here nor there, although
an excellent weapon and invaluable upon occasion, but a deeply
rooted prejudice is a very objectionable thing, and should be torn out
and cast away. One day we were walking along, when the guide sud-
denly called out, and there in the top of a very tall tree was a fair-
sized black bear. I naturally stepped forward, secured a good place,
took aim, and was about to fire, when it occurred to me that here
was a splendid opportunity to make my friend do something bold and
aggressive and disregard his rooted objections. I called him to where
I stood, assured him that, having shot a lot of game, a bear more or
less was of no moment to me, and I determined he should kill it.
Excited as he was, he took the gun, took steady aim, although I no-
ticed that in his excitement the muzzle of the gun described gigantic
ellipses here and there, and I had not the least notion that he would
hit the object, yet to my unspeakable astonishment and his infinite
delight the quarry tumbled out of the tree stone dead.

There is something savage in the breast of all of us men which
the "gaudia certaminis" inevitably brings out. From that moment
he was a changed man, and for the rest of the day if any legitimate
prey had presented itself he would have ruthlessly wrought murder.

One after another his prejudices were overcome, his initial im-
pulses strengthened, his simple, manly qualities brought back to the
surface, and his body steadily strengthened. When away from me
he failed to progress with rapidity, although in the main he gained

sufficiently by seeing me twice or three times a year, and being under my care for two or three months every summer to gain in vigor mentally and physically until he was able to resume his regular occupation and to be as other men are. Much of the good was wrought by spending a couple of months in camping out, where he had to depend upon himself for many of his comforts,—chopping his own wood, drawing his own water, and many times preparing his own food.

A CASE OF LOCALIZED SPASM AFFECTING THE FOOT-MUSCLES AND FOLLOWED BY LOSS OF CONSCIOUSNESS; THE DIFFERENTIAL DIAGNOSIS OF ORDINARY EPILEPSY AND OF JACKSONIAN EPILEPSY; THE TREATMENT OF EPILEPSY.

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GENTLEMEN,—This patient, a boy aged fourteen, has just been brought to me by my friend Dr. Rorie. I have not yet had the opportunity of investigating the case thoroughly, but I have ascertained some of the more important points. It presents some points of interest, and I propose that we should discuss the diagnosis and treatment together.

The patient's appearance is, you will see, indicative of good health; with the exception of the peculiar spasmodic attacks which I shall presently describe, he is, in fact, perfectly well. He does not complain of headache, vomiting, or giddiness. The optic disks are perfectly natural.

Fifteen months ago he began to be troubled with localized spasmodic movements affecting the muscles of the right foot and leg; the attacks have continued at irregular intervals ever since; they occur sometimes once a week, sometimes once a fortnight, sometimes once a month. The longest interval between the attacks has been nine weeks. The spasmodic seizures invariably occur soon after he wakes from sleep; they have never occurred at any other time. The attack begins with spasmodic shaking of the right foot and leg; after a brief interval the spasm ascends to the thigh, and the patient then becomes unconscious. He remains unconscious for two or three

minutes, and during the condition of unconsciousness, his friends state, there are no spasmodic movements or twitchings in any other part of the body. Dr. Rorie has never had an opportunity of seeing one of these attacks. There is no cardiac lesion and no renal disease. None of the boy's relations have suffered from epilepsy, and the patient himself has never, his friends say, had a typical, "full-blown," epileptic fit.

I will now put one or two additional questions to the patient. In answer to these questions the patient stated that he suffered from temporary headache after the attacks; that the pain was felt all over the head; that he was sleepy after the attacks; that when he awoke from the sleep following the attacks he felt tired; and that his memory was not as good as it used to be.

Such are the facts of the case, and I want you to suggest a diagnosis.

Ans.—A cicatrix on the motor area of the cerebral cortex involving the foot centre.

There is no history of injury; the scalp seems perfectly normal. There is no tenderness on pressure over any part of the head. There is certainly no evidence to show that there is a cicatrix, the result of injury. Perhaps somebody will suggest something else.

(Cerebral tumor, embolism, abscess of the brain, worms, hysteria, meningitis, reflex irritation, uræmia, Jacksonian epilepsy, cerebral softening, spasm of the arteries supplying the leg centre, were all mentioned in turn by different students.)

Well, gentlemen, you have certainly suggested a large number of different causes, many of them very grave and serious lesions; but you have not suggested *the* condition which seems to me in all probability to be the most likely cause for the attacks.

I repeat that there is no history of injury, that the spasms occur at irregular intervals, that they are often separated by several weeks of perfect health, that there is no headache, no vomiting, and no optic neuritis. The patient becomes unconscious soon after the spasm occurs. When he wakes from this state of unconsciousness he complains of headache; he then goes to sleep. His memory is not so good as it used to be. Now, what do these facts suggest?

Ans.—Ordinary epilepsy.

Yes, that is the condition which seems to me to be the most likely cause for the attacks.

We may, of course, definitely exclude tumor and other "coarse" lesions; there are no symptoms or indications of a coarse lesion present. The localized character of the spasm is, of course, suggestive of local irritation, and I suppose it is because many of you are aware that the localized spasms to which the term Jacksonian epilepsy is applied usually result from the presence of a localized lesion such as a tumor or cicatrix in the motor area that some of you have suggested that this is a case of Jacksonian epilepsy, and that it is due to the presence of a tumor or cicatrix on the surface of the brain. But you must remember that the mere presence of localized spasms is not sufficient to warrant a diagnosis of tumor or "coarse" cortical lesion. Localized spasms are certainly suggestive of a localized source of irritation, but in the absence of other symptoms suggestive of a "coarse" cerebral lesion we are not warranted in supposing that the spasms are due to a tumor, cicatrix, etc. Of course, this may be a case in which a localized coarse lesion is present, but in which there are no general symptoms. That may possibly be so; it is well, perhaps, to keep that possibility—it is not a strong probability—in view. But, with the facts which we have before us, a *diagnosis* of a "coarse" cerebral lesion is quite unwarranted.

Cerebral softening has also been suggested as a cause of the localized spasms in this case. A localized softening in the neighborhood of a motor centre may without doubt lead to irritation and discharge of that centre and may produce localized spasms, but in this case there is no reason to suspect the presence of a softening. Cerebral softening is usually, of course, due to embolism or thrombosis. A softening in the motor area is almost necessarily attended with some paralysis. In this case there is no paralysis. The heart and arteries are perfectly healthy; there is no reason to suspect syphilis. Further, if the case were one of softening due to embolism, we should have a history of an acute onset with paralytic symptoms.

Uræmia has also been suggested. That, of course, is a very wild opinion. Patients who are suffering from uræmia do not go about as this boy does in a condition of good health. Further, in this case there is no kidney-disease; the urine is perfectly natural. Again, uræmia very rarely is the cause of localized spasms, though such spasms may be produced in this way.

Meningitis may also, of course, be excluded. There is nothing in this case to indicate such a condition.

Several of the opinions which have been expressed suggest some functional derangement, such as hysteria, reflex irritation due to worms, etc.   The history which we have elicited is not in the least suggestive of hysteria. The patient, you will observe, is unconscious during the attacks, and he has not manifested any of the symptoms and signs of hysteria.

The view that the spasms are due to reflex irritation has, so far as I see, nothing to support it.   Convulsions are doubtless in some cases due to reflex irritation, more particularly in children; but one should be very chary of diagnosing reflex epilepsy and reflex paralysis. One is only justified in concluding that an epileptic fit or a paralysis is reflex, in the *first* place, when a cause of reflex irritation is present; in the *second* place, when there is no other cause apparent for the epilepsy or paralysis; and in the *third* place,—and this is by far the most important point,—when, on removal of the source of irritation, the epilepsy or the paralysis disappears. In many of the cases in which epilepsy appears to be due to a reflex irritation, such as worms in the intestine, the local irritation is merely an exciting cause. In many of these cases the nerve-centres are in a condition of unstable equilibrium and liable to be discharged by slight causes; in short, in many of these cases the patient has, either as the result of inheritance or an acquired condition, an epileptic tendency. In the production of many diseased conditions it is of course quite common to find more than one cause in operation, and in dealing with cases of epilepsy it is always well to remember that reflex irritation may be the exciting cause of the fits.   In the treatment of epilepsy one should always look for a possible source of reflex irritation, and, if it is present, remove it.   But the removal of a source of peripheral irritation is rarely of itself sufficient to effect a cure; one has also to give remedies, such as the bromides, which soothe down the irritable and unstable nerve-centres.

Jacksonian epilepsy has been mentioned. Now, the term Jacksonian epilepsy does not signify a disease, but merely a group of symptoms. You should never be content with coming to the conclusion that a case is one of Jacksonian epilepsy; you should always push the inquiry further and endeavor to determine what is the special cause of the Jacksonian epilepsy in each individual case. Usually, as many of you have correctly stated, Jacksonian epilepsy is due to a localized "coarse" cortical lesion which acts as a source of

irritation and leads to the production of recurring discharges in the adjacent motor gray matter. Now, in this case there is a localized spasm of the foot-muscles, but there are no symptoms or signs of a "coarse" intracranial lesion. Because the spasms are localized it does not, of course, necessarily follow that the case is one of Jacksonian epilepsy. Further, in typical cases of Jacksonian epilepsy the localized spasms usually recur with great frequency, with much greater frequency than the spasms occur in this case. Again, the localized spasms in cases of Jacksonian epilepsy are not attended with loss of consciousness, unless the irritation should spread over an extensive area of the brain cortex and a number of cortical centres should be discharged; in fact, in most cases, unless the spasms become general and bilateral. Further, in typical cases of Jacksonian epilepsy it is usually found that the muscles which were convulsed during the attack are temporarily paralyzed after the spasms pass off. The paralysis is merely temporary and passes off in the course of a few hours, or a day or two at most, unless, of course, the spasms should recur at very frequent intervals; in such cases the paralysis may, of course, persist so long as the discharges and attacks of Jacksonian epilepsy continue with sufficient frequency to prevent the discharging centre regaining its natural energy. In cases of Jacksonian epilepsy the paralysis is apparently due to the exhaustion of the motor gray matter which was violently discharged in the fit. Hence it is that the paralysis involves the muscles which were affected with the spasm.

Now, in this particular case, the spasms occur at long intervals; they do not become general; they are always followed by loss of consciousness, and never by paralysis. These facts show that the case is not one of Jacksonian epilepsy. It seems to be a case of ordinary idiopathic epilepsy in which the attack is ushered in with a localized muscular spasm.

Let me say a word or two with regard to epilepsy in general and the epileptic aura in particular. The chief characteristic of an epileptic fit is loss of consciousness; this is the central fact; without loss of consciousness it is usually impossible to diagnose epilepsy. In typical hysterical fits, on the other hand, there is no loss of consciousness, although, as you are aware, the combined condition termed hystero-epilepsy, in which consciousness is lost, does occur.

There are several forms of epilepsy. The two most common and

important are *petit mal* and *haut mal.* In *petit mal* there is loss of consciousness without spasm; in *haut mal* there is loss of consciousness with marked convulsive movements, which are at first tonic and then clonic.

Now, in a large proportion of cases of epilepsy (probably in at least fifty per cent.) the loss of consciousness is preceded by a condition which we term an *"aura,"* a warning sensation. The exact nature of the aura is very various. In many cases it consists in a "feeling" of some sort or another, often a sensation of something passing up from the stomach to the head; it may be a pain in some part of the body, a feeling of tingling or numbness, a flash of light, a noise, a smell, or a taste. In some cases, it consists of a "creepy" feeling, a feeling of cold or chilliness, often felt in the spine. In some cases the sensory aura is more highly specialized, and the patient may see a definite object just before the commencement of the attack, such, for example, as a white rabbit, which was always seen in one of my cases just before a fit. Any sensation which we are capable of experiencing may be felt at the commencement of an epileptic fit,—may, in fact, constitute an aura. This is only what you would expect, for every part of the sensory nerve apparatus is either directly or indirectly represented or re-represented in the brain.

But in some cases the aura is motor, not sensory. The aura may consist of a localized spasm.

The aura, you must remember, represents a localized discharge in a limited part of the cerebral cortex. If a localized portion of sensory gray matter in the cerebral cortex is discharged, the patient will feel a sensation of some kind or another, the exact nature of the sensation depending, of course, upon the function of the sensory centre which is first discharged. If a localized part of the motor cortex is discharged at the beginning of the attack, the aura will be manifested externally in the form of a localized spasm or convulsion. In cases of Jacksonian epilepsy the discharge is usually limited and localized, but in cases of ordinary epilepsy the discharge which *begins* in a localized and limited area of the brain cortex rapidly extends, spreads over the whole of the hemisphere or both hemispheres, and a general convulsion with loss of consciousness is the result.

In this particular case the localized spasms seem to me to be of the nature of an aura, and the case seems to be one of ordinary epilepsy.

Another point of interest in this case, to which I have not as yet referred, is the fact that the development of unconsciousness can sometimes be prevented by tying a string or a handkerchief tightly round the thigh when the spasm in the foot commences. Popularly speaking, the ligature is said to arrest the extension of the aura in its passage from the foot to the head, for patients who know nothing about pathology and physiology naturally think that the aura which ushers in the fit actually consists in a something which spreads from below upward. They feel a sensation or pain, for example, in the case of a sensory aura which gradually passes up, say, from the tip of the forefinger to the forearm, arm, etc., or they see the muscular spasm which begins in the foot gradually extend to the muscles of the leg and then to the muscles of the thigh; and they know that after the aura has extended upward for a certain distance they lose consciousness and have a fit. Hence they not unnaturally conclude that the aura actually consists in a tangible something which passes from below upward. But *we* know that the aura is merely an external manifestation of an internal functional change which is taking place in a localized area of the cerebral cortex. The conscious sensation which the patient experiences as the result of the sensory discharge in a localized area of the cerebral cortex is referred, in accordance with the law of "eccentric projection," to the part of the body from which the particular sensory centre is in the habit of receiving impressions. In the case of a motor aura, the discharge in the localized portion of motor gray matter which first takes place at the beginning of the attack is manifested externally in the form of spasmodic contractions or movements in a localized muscle or group of muscles; in those muscles the movements of which are represented in the localized area of gray matter which is discharged at the commencement of the attack.

Now, the ligature in cases of this kind probably arrests the fit by producing an inhibitory effect upon the discharging centre and the surrounding portion of gray matter. The ligature produces reflex inhibition of the irritated area or areas in the cerebral cortex. This, so far as I know, is the only satisfactory scientific explanation which has as yet been advanced.

As a matter of experience, we find that in some cases when a fit is arrested in this way the effect is beneficial, in others prejudicial.

(The patient was then questioned as to the effect of the stoppage

of the fit in his particular case. He seemed to think that it was bene-
ficial.)

In this particular case, gentlemen, no prejudicial effect seems to
be produced by the arrest of the aura. But, as I have already told
you, this is not always the case. During the time that I was physi-
cian to the Newcastle Infirmary I remember very well a case in
which the development of an epileptic fit could be prevented by stop-
ping the aura,—ligaturing the limb in this way. In that case the
patient always felt dull and stupid for some time after the ligature
was applied; until, in fact, a fit occurred, and it always did occur
within a short time after the artificial arrest of the aura. In that case
the effect of the ligature was simply to "bottle up" the discharge, and
the "bottling up" of the discharge was uncomfortable to the patient;
she felt stupid and muddled until the discharge took place. In some
cases of epilepsy the discharge seems to have the effect of clearing
the sensorium. You must judge, therefore, of the advisability of
arresting the fits by "ligaturing the aura" by the effects which are
produced in each particular case.

Before leaving this case, let me say a word or two regarding treat-
ment. I should propose in the first place, at all events, to treat the
case as an ordinary case of epilepsy, to give bromides in gradually
increasing doses, and, failing the bromides, borax or other remedies
which experience has shown to be beneficial in epilepsy. If this
internal treatment fails to give relief, we might, I think, with ad-
vantage try the effect of counter-irritation over the centre which is
first discharged,—the foot centre in the left hemisphere. Blistering
the head or the application of the button cautery to the scalp are
undoubtedly in some cases of this kind attended with benefit. If
these measures should fail to give relief, the question of operative
procedure may then have to be considered. In cases of idiopathic
epilepsy, such as this appears to be, an operation should not be lightly
undertaken. It is only when drug treatment has been thoroughly
tried and has failed that the question of surgical treatment should be
entertained. I do not, you will observe, say practised; for it is only
in special cases of idiopathic epilepsy that an operation is likely to be
beneficial. When one is satisfied that drug treatment has completely
failed to give relief, in cases in which the fits recur with great fre-
quency, in which the general health or the mental condition of the
patient is becoming seriously impaired, in which the disease is unfit-

ting the patient for the ordinary duties and avocations and enjoy-
ments of life, an operation is, I think, justifiable, provided that the
patient or his friends are anxious that something more should be
done. But it must be remembered that in cases, of ordinary idio-
pathic (non-traumatic) epilepsy in which there is no local commence-
ment or aura, the results of operation are very far from encouraging.
Hence in cases of idiopathic epilepsy in which the conditions
enumerated above are present, while, on the one hand, I would cer-
tainly not advise or press an operation, on the other, I would not feel
myself justified in opposing an operation, provided that the patient
or his friends were anxious that it should be performed. The risk
to life which the operation of trephining entails is small; and while
experience shows that it comparatively rarely, in cases such as we are
considering, produces permanent benefit, I am not prepared to say
that it might not do so. The only operation which is likely to give
permanent relief in cases of idiopathic epilepsy is trephining the skull
and cutting out a portion of the discharging centre. Consequently,
in cases such as this, in which the discharge begins in a definite local
way, an operation is much more likely to be beneficial than in those
cases of idiopathic epilepsy in which there is no aura; in which there
is no local discharge preceding the general convulsion; in which, in
other words, there is nothing to show in what part of the cerebral
cortex the epileptic discharge commences. Of course, if a cicatrix
or other coarse lesion is found on the surface of the brain when the
head is opened, its removal is all that one would think of accomplish-
ing, in the first instance at least. But in this case there is nothing, so
far as I see, to indicate the presence of a coarse lesion. If any good
is to be accomplished by operative procedure in this case, the portion
of gray matter in which the discharge commences must be excised.

Now, the foot and leg centre is not a small area, and it might
be difficult to hit upon the exact portion of gray matter which was
the seat of the primary discharge. Faradic irritation of the cortex
after its exposure by the surgeon affords most important diagnostic
information in cases of this kind.

The removal of a considerable mass of motor gray matter is
almost certain to be attended with some paralysis, and in a case of this
kind it is only when drug treatment has completely failed, and the
symptoms are so urgent as to warrant one in running some risk, that
the surgeon is justified in producing a paralysis which may perhaps

be permanent, with the hope—the small hope—of curing the fits. I do not mean to say that in all cases in which a portion of motor gray matter is removed the paralysis is permanent. In many cases the paralysis, or a large part of the paralysis, passes off in the course of time. It is only when a very large area of gray matter is removed that marked and permanent paralysis may be expected to remain.

Well, in this particular case we will first try the effect of drug treatment. If that completely fails, it will be time enough to discuss the question of operative procedure.

Note as to the Effects of Treatment.—Dr. Rorie subsequently informed me that the course of the case showed that the diagnosis (idiopathic epilepsy with localized motor aura) was correct, for (*a*) the patient subsequently had more than one typical epileptic fit, and (*b*) he did not manifest any symptoms indicative of a local or "coarse" cerebral lesion. Further, under the continued steady use of moderate doses of the bromides the progress of the case was highly satisfactory, the fits being kept in check.

Surgery.

FRACTURES OF THE RIM OF THE ACETABULUM AND OF THE MARGINS OF OTHER JOINTS, COMPLICATING DISLOCATIONS.

CLINICAL LECTURE DELIVERED IN MERCY HOSPITAL, CHICAGO.

BY EDMUND ANDREWS, M.D., LL.D.,

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GENTLEMEN,—Marginal fractures complicating dislocations are very frequent. Professor Sims says that dead-house examinations show their presence in a very large proportion of dislocations in all parts of the body.

It is to be regretted that the standard authors give very little attention to these accidents. They are often difficult of diagnosis, because the obvious symptoms of dislocation mask and conceal the slighter evidences of a fractured rim; hence the practitioner is liable to overlook the complication, and afterwards finds it impossible to explain why he cannot keep the head of the bone in place. Quite frequently he is charged with not having replaced it in the socket at all, and is sometimes sued for malpractice. Let us consider the principal joints separately.

FRACTURE OF THE RIM OF THE ACETABULUM.

The upper and posterior margin of the acetabulum is high and sharp, and not as thick as the anterior border; hence the higher and thinner portion is the part generally broken, and the coincident dislocation is usually upward and backward through the notch made by the fracture.

In many, if not in most, cases the nature of the accident is this: The patient is thrown forward with his bent knee resting firmly on

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the ground and the body bent forward at a right angle with the femur, while some heavy weight falls upon the posterior part of the pelvis, driving the acetabulum down upon the head of the femur. Sometimes the position is reversed, and the patient is thrown with his back on the ground and the thigh pointing upward, when a weight falling on the bent knee may drive the head of the femur through the posterior margin of the joint.

I had one case where the rim was thinned and weakened by tubercular ulceration, while the head of the femur was nearly sound. As the patient lay in bed the muscular action pulled the head of the bone through the weakened rim and caused dislocation. Operative measures enabled me to see the exact condition, and to remove the tuberculous tissue. The patient recovered.

Authors state that replacement through the gap of the fracture is usually easy, but I met with one decided exception to the usual ease of reduction. The patient was thrown from an upset wagon, falling on his hands and knees, while the wagon-box fell on the back side of his pelvis, driving it down against the femur. The patient was sent to Mercy, to the ward of Dr. E. W. Andrews, but the doctor happening to be absent from the city, the injured man was brought before you at my clinic. The symptoms of dislocation upward and backward were clear. He was etherized, and efforts at reduction were made by manipulation without success. The patient had received obscure abdominal injuries at his accident, and while on the table under manipulation became alarmingly prostrate, so that the efforts were suspended and the patient was returned to bed. He was better the next day, and was again etherized. Every kind of manipulation was faithfully tried, and also the pulleys and Jarvis's adjuster applied, but in vain. The head of the femur could be brought apparently nearly or quite into position with something like a snap of reduction, but it would not remain there a moment when the force was relaxed. The patient again showed signs of prostration, and had to be returned to bed.

The next day Professor E. Wyllys Andrews returned to the city, and the case was, by the hospital rule, returned to his charge. I suggested to him that he operate by incision. The patient was again in good condition and readily etherized. The professor therefore made an incision in front of the anterior border of the trochanter, and laid open the capsule of the joint. The upper and outer wall

of the acetabulum was found broken away. A large piece of bone was detached, about an inch and a quarter wide by an inch and a

Fragment broken from the margin of the acetabulum.

half in length, and shaped as in Fig. 1. One border of it was attached to the torn capsular ligament in such a way that it swung like a door on a hinge, shutting up the gap and preventing the head of
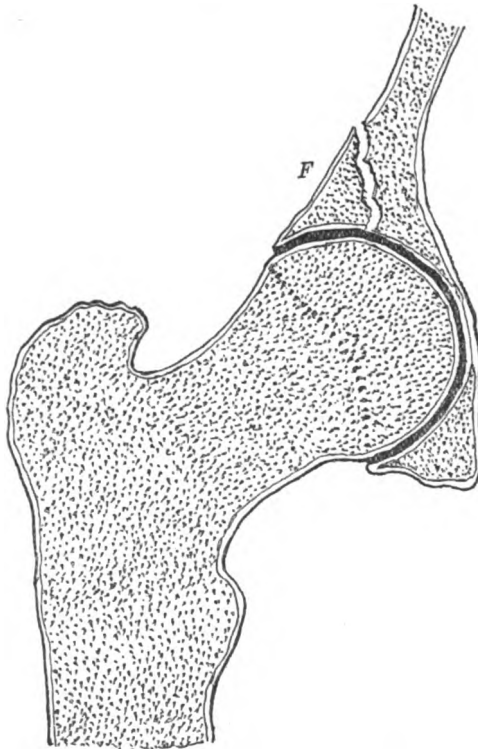
Fracture of the posterior margin of the acetabulum. Sectional view. F, the detached fragment.

the femur from re-entering whenever an effort at reduction was made. It was only by cutting away the fragment that the caput femoris could be replaced in the socket. The wound was dressed

antiseptically and the patient returned to bed, with extension in the abducted position. All went well for three days, but at the end of that time he developed abdominal complications from his internal injuries and died.

I met two other cases in which the reduction was effected without any incisions. In one the head of the bone would remain in position a few minutes, but unless extension was kept up would slip out again. However, by extension and abduction it was kept in good position several weeks, but on removing the extension it soon glided out of place. The other case was similar. After some weeks of extension the weight was taken off and the bone at once slipped out of position. Both patients recovered, so that there was no autopsy, but the use of the limbs was of course impaired.

The first record of a dislocation with fracture of the acetabulum which I have been able to find is in a report by Sir Astley Cooper in St. Thomas's Hospital, London, in 1791. The patient had several severe injuries besides the dislocation of the hip. The displacement was reduced, but could only be retained by constant extension. He died on the third day. At the autopsy the margin of the acetabulum was found extensively broken away.

Other cases were reported by Maisonneuve, McTyer, R. W. Smith, Lonsdale, Holmes, Eve of England, Gurlt, and Foville. The case reported by the latter remained in good position some weeks while in bed, but slipped out as soon as he attempted to walk. A valuable paper on this subject was written by Dr. Nicholas Senn some years ago, in which he collected from various authors reports of twenty-seven cases, part of which are the same as those which I have enumerated above. Several of these patients made a permanent recovery by keeping them for some weeks in bed with the limb extended in an abducted position. Others, however, relapsed. It appears at any rate that in these fractures there will be perfect cures of part of the cases by maintaining the abduction and extension for the usual six, eight, or ten weeks required by fractured bones. As there is no possibility of determining the progress of the hoped-for bony union, it would be better to prolong the treatment beyond the usual period for fractures, so as to allow for possible slowness in the reparative process.

FRACTURES OF THE MARGIN OF THE KNEE-JOINT.

The only fractures of the margin of the knee-joint which are at all common are the splitting off of the condyles of the femur. These are of course well known, and scarcely require any attention from us in this lecture. The rare cases are those which affect the margin of the upper face of the tibia. It is almost impossible to find any reports of this accident, except those caused by gunshot wounds, and by blows of hatchets and of other implements, or by crushing injuries. I saw one case where a blow from a corn-cutter chipped into the tibial margin and set up a suppurative synovitis of the knee, but there was no dislocation. The simple fractures of this rim with dislocation are rare. I have seen only one, which I now place before you.

FIG. 8.
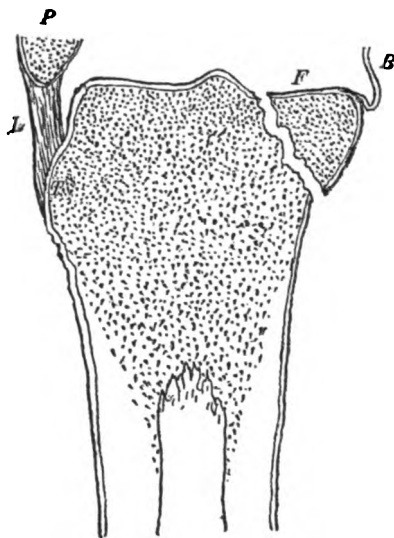
Sectional view of the head of the tibia, showing fracture of the posterior margin of the knee. *F*, the displaced fragment of the tibial margin; *B*, the posterior part of the capsular ligament, showing the usual fold at its lower part; *P*, the lower end of the patella; *L*, the ligamentum patellæ; *T*, the tuberosity of the tibia.

A patient received an injury of the knee many months ago which was believed to be a simple dislocation of the tibia forward. His physician was unable to retain the parts in position after they were reduced. Many months have now elapsed, and the patient desires if possible a restoration of the parts to their natural condition. As

he lies on the table you observe that the tibia is displaced forward, but not nearly so far as in a complete dislocation. It can only be a partial one. There is a moderate shortening, and the joint is ankylosed in a straight position. Now, a simple partial dislocation forward to this slight extent, if once reduced, would not have reproduced itself. The femur, not being out of the cup of the joint, would slip into its place again and stay there if the cup had not been deprived of its shape by a fracture.

The fact is, the posterior third of the tibial articular cup was broken down in an oblique direction,—that is, sloping downward and backward,—letting the anterior third slide up in front of the condyles. The fracture must be such a one as I show you in this drawing. I fear there is no possibility of replacing the parts at this late day, and as the patient walks pretty well in spite of his stiff knee, it is not worth while to make an excision of the joint. However, we will try extension under ether. I now apply a powerful Jarvis's adjuster, which exerts an immense force. You see that nothing yields and there is no hope of success. We will therefore give up the effort.

FRACTURES OF THE MARGINS OF THE ANKLE-JOINT.

One of these injuries is of historical importance, and is prolific in mistakes in diagnosis, in difficulties of treatment, and, finally, in malpractice suits.

Long ago Malgaigne noticed that in dislocations of the tibia forward upon the dorsum of the foot, there was often an invincible disposition for the dislocation to slip out after reduction. He made various inventions to prevent the redislocation, and, in fact, was so energetic that some of his patients are said to have died of the treatment.

One case occurred in Illinois in which the persistent recurrence of the displacement led to a malpractice suit.

In another of these cases the injury to the limb was such as forced me to amputate it, and I was thus able to examine the joint and discover the cause of the continual slipping out of place. I found the posterior lip of the tibial cup broken completely away, converting the lower end of that bone into an inclined plane, which irresistibly tended to slide down the slippery arch of the astragalus to the dorsum of the foot.

About this time, or a little earlier, Professor Jarjavay, the successor of Nélaton in Paris, proved the same thing by numerous dissections in the Hôpital Beaujon. He was the first to explain the anatomical reason of the difficulty in retaining the position of the parts after reduction.

It is greatly to be regretted that many of our standard authors seem absolutely ignorant of these facts, and treat of ankle-joint dislocations as if these rim fractures never had any existence.

When the accident removes only a narrow strip of bone from the posterior lip of the articulation, the tendency to redislocation is slight, but if it takes away more of it, it greatly increases the trouble.

In my investigations I have discovered an important fact, not mentioned by authors, and it is this: It is much easier to keep the bones in proper place if the foot is dressed flexed at an acute angle instead of the right angle, directed in the text-books. Looking at Fig. 4, we see that the anterior part of the astragalus forms a concave

FIG. 4.
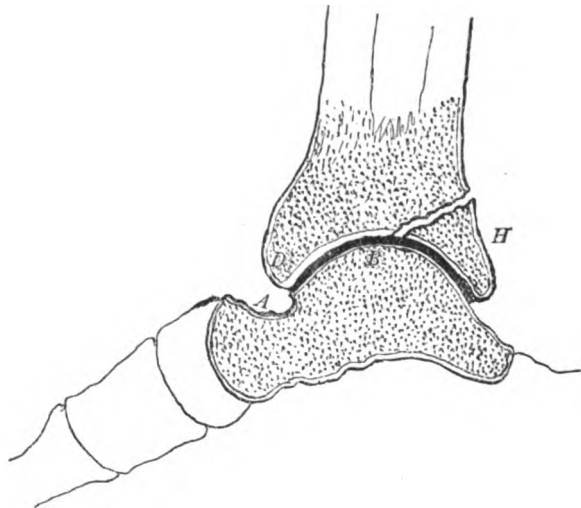
Section of the ankle-joint, showing fracture of the posterior lip of the tibial cup. *H.* the fractured posterior margin; *D*, the thick anterior margin; *B*, the articular eminence of the astragalus; *A*, the platform on the neck of the astragalus.

platform *A* in front of the articular eminence *B*. By bending the foot upward towards the front of the tibia, this shelf is flexed up against the anterior lip of the joint *D*, thus making a solid barrier, which in most cases prevents the tibia from sliding forward; in fact,

leaves it no space into which it can slip.   This position is a great help in many cases.

The other usual directions, such as flexing the knee to relax the gastrocnemii, cutting the tendon of Achilles, using pressure splints, etc., are to be observed.   If they fail, excision of the joint is often required.

FRACTURE OF THE MARGIN OF THE SHOULDER-JOINT.

This accident is fairly well discussed in surgical liteiature.   The lower half of the rim is the usual seat.   The extent may vary from the slightest gap in the marginal cartilage up to a complete shatter-ing of the whole glenoid platform.   In simple marginal fracture of the glenoid cavity the bone may usually be reduced with abnormal ease, and gives the snap of reduction.   It may also be redislocated with equal readiness, while the coracoid process stands immovably attached to the scapula.   If the whole glenoid cavity is shattered in pieces, there is no definite snap of reduction, and the coracoid moves independently both of the humerus and of the scapula.   In fractures

FIG. 5.
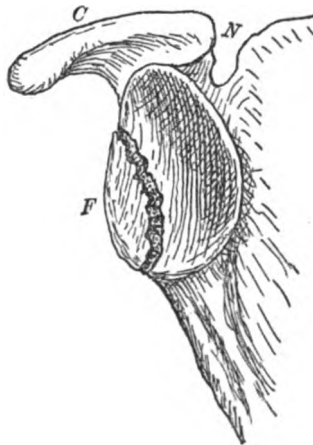
Fracture of the lower and anterior margin of the glenoid cavity. *F*, the separated fragment; *C*, the coracoid process; *N*, the supra-scapular notch.

of the neck of the scapula only, the coracoid moves separately from the body of that bone, but sympathizes with the movements of the head of the humerus.   Fractures of the neck of the humerus can be distinguished from all these by the fact that the head of the humerus can be grasped in the socket by seizing it antero-posteriorly between

the thumb and finger, and thus discovering that it is still in place, and that the shaft of the bone moves separately from it.

The treatment of glenoid fractures consists in reduction, in bandaging or strapping the elbow so as to lift the humerus upward, putting on a long shoulder-cap splint, bandaging the humerus out against it, and filling the axilla well with a pad.

MARGINAL FRACTURES AT THE ELBOW.

Fractures of the condyles are not truly marginal, and the breaking off of the olecranon is usually more a central than a rim fracture.

On the contrary, the fracture of the coronoid process is a true marginal accident. The anterior border being broken away, the

FIG. 6.
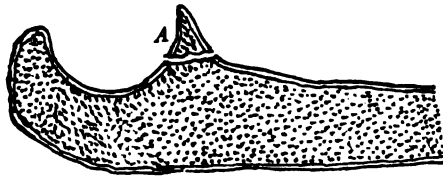
Section of the upper end of the ulna, showing a fracture of the coronoid process. *A*, the fractured process.

ulna slips backward, and presents the aspect of a backward dislocation of that bone. It is diagnosed by the abnormal ease with which it slips into and out of place.

FIG. 7.

Antero-posterior section of the lower end of the radius. *A*, the thick anterior lip of the joint; *B*, fracture of the thin posterior lip.

The treatment is reduction, and acute flexion in an angular posterior splint. Acute flexion is almost a perfect safeguard of itself against displacement, but a splint adds somewhat to the security.

MARGINAL FRACTURES AT THE WRIST.

The anterior or posterior border of the lower end of the radius may be chipped off. (Fig. 7.) The appearances are those of Colles's fracture, and the treatment is the same.

This whole subject is a neglected one, but important. It is the duty of all practitioners to study it carefully and use great diligence in their examinations and treatment of the cases.

FOREIGN BODIES IN THE AIR-PASSAGES.

BY T. PICKERING PICK, F.R.C.S.,

Senior Surgeon to St. George's Hospital, London.

GENTLEMEN,—I have placed on the table before you several interesting preparations of foreign bodies in the air-passages. In some the foreign body remains *in situ*, in the position in which it was found at the post-mortem examination; in others I have only the foreign body itself to show you, for it was removed or expelled during life. I propose this afternoon to narrate to you some of these cases, and thus illustrate some of the points in connection with this very serious and important condition. I need scarcely remind you that any foreign matter, gaseous, fluid, or solid, may enter the air-passages. With regard to the two former, I do not propose to say anything, but to confine our attention to the introduction of solid substances. And we shall find that solid bodies of the most diverse kind may enter the air-passages, and that the symptoms which are produced vary according to the nature and size of this foreign substance. I think, for purposes of clearness and in order to distinguish between different cases, it is advisable to divide these foreign bodies into two classes,—(1) those which are large and generally soft, and which cannot, therefore, pass through the rima glottidis, and (2) those which are smaller and for the most part hard, and which, therefore, are able to pass through the rima and become lodged in some part of the air-passages below this chink. Occasionally, nevertheless, it does happen that *soft* bodies of small size do pass through the rima glottidis. This is generally during the act of vomiting. For instance, some years ago I was operating upon a lady for strangulated hernia. Just at the moment that I divided the stricture she vomited, some of the vomited matter found its way into her air-passages, and she died on the table.

Let us consider, first, what would happen if a large, soft body, like a piece of meat, is introduced into the air-passages, by a sudden inhalation, just at the moment that it is carried to the back of the mouth during the act of deglutition, and is getting beyond the control of the will. It is too large to pass through the rima, and therefore mechanically blocks up the upper cavity of the larynx and entirely prevents the ingress of air. Each effort at inspiration only serves to wedge it more tightly in its position.

Here is a preparation which will illustrate this condition. You will see that it is the pharynx, larynx, and œsophagus, and that the pharynx and œsophagus have been laid open from behind. A mass of meat is tightly wedged into the superior aperture of the larynx, and completely blocks the air-passages. It will also be seen that a part of the mass projects into the pharynx, and is fixed there. It is quite evident that not even the slightest amount of air could find its way into the lungs. The preparation was taken from a man, aged fifty-six, who was a cab-driver. He was sitting at his dinner in a coffee-house, when he was summoned to attend a fare; he started up hurriedly, was noticed to gasp for breath, became black in the face, and almost immediately died.

The symptoms in these cases are those due to the sudden cutting off of all access of air to the lungs. There is a sudden feeling of intense suffocation; the patient makes violent efforts at inspiration, becomes black in the face, falls insensible, and dies almost immediately, unless assistance is at once rendered. They arise from the patient attempting to bolt a large piece of meat and, at the moment of doing so, taking a sudden inspiration, so that the current of air draws the mass between the margins of the glottis, where it becomes fixed.

These are very serious cases, and, unless prompt assistance is rendered, terminate fatally in a few seconds. What, then, are we to do in case one happens to be present at the time the accident occurs? because in many cases medical assistance cannot be obtained until it is too late and the patient is dead. You would first of all force the mouth open and attempt to dislodge the foreign body with the fore-finger. As it is usually large and situated at the upper opening of the larynx, this can very often be done, and all is well. Supposing, however, it cannot be dislodged, then you should at once open the larynx. This can be done with an ordinary penknife, and need not

occupy more than a few seconds. The larynx is steadied with the forefinger and thumb of the left hand, and a vertical incision is made in the middle line over the crico-thyroid space, passing down to the membrane at once; this is then opened by a second cut made horizontally just above the cricoid cartilage. If the patient has not ceased to breathe, air will now be heard to be sucked into the lungs, the lividity will rapidly disappear from the face, and the patient's life will be saved. But sometimes it may happen that the patient has already ceased to breathe, and then it will be necessary to resort to artificial respiration. In order to do this it will be requisite to adopt some measure to keep the opening in the larynx patent. This may be done by two hair-pins, which are generally easily obtainable, bent down about a half or three-quarters of an inch from their points, so as to form double-pronged hooks, which can be inserted into the opening in the larynx on either side, and be held by a by-stander while you are performing artificial respiration; or a toothpick quill, with the end cut off, may be held in the wound by an assistant, care being taken that it is not allowed to pass altogether into the air-passages.

We now pass on to consider the larger and more interesting class of cases, where the foreign body is smaller, so that it can pass through the rima glottidis, and where it is generally hard in its nature, such as a piece of bone, a pebble, a button, a cherry- or plum-stone, or something of this nature. Having passed into the air-passages, it may become lodged in one of the ventricles of the larynx; or it may pass into the trachea; or it may descend through the trachea and become lodged in one of the bronchi or its ramifications, and the after-symptoms will vary according to the position in which it is situated. But in all the primary symptoms will be the same and will be those of obstruction.

The cause of the obstruction will not, however, be the same in these cases as it was in those to which I have previously referred. There it was purely mechanical, due to the blocking up of the upper opening of the larynx by a mass which completely closed it. In these latter cases it is due to reflex spasm of the muscles of the glottis. The foreign body, in passing through the highly sensitive rima, irritates the sensory nerves supplying its mucous membrane, and this induces a reflex spasm of the muscles of the larynx, which effectually closes the chink and prevents the admission of air, and thus

symptoms of obstruction similar to those observed in the other class of cases are set up. These symptoms differ, however, in one essential and most important particular from those due to mechanical blocking of the air-passages, and that is in the fact that they do not persist until the patient's death. There is the same intense sensation of suffocation; there is the same defective aëration of the blood, and the patient becomes black in the face and more or less insensible. But now innervation is arrested, the spasmodic contraction of the muscles passes off, and the patient takes an inspiration, generally accompanied by a croupy sound, and the symptoms of obstruction disappear. The foreign body has now passed onward, and the symptoms to which it gives rise are due to irritation and will vary according to its size, nature, and situation. When the foreign body is in the cavity of the larynx, the symptoms will depend much upon its nature. When it is sharp and angular and projects from the ventricle into the cavity of the larynx, irritating the vocal cords, there will be great distress and a constant sense of suffocation, accompanied by spasmodic cough and a croupy respiration, and with this there will be alteration in the voice-sounds, the articulation being either hoarse or altogether lost. But when the body is buried in the ventricle and is rounder and smoother, the majority of these symptoms may be absent, the only one present being the loss or hoarseness of the voice. When, therefore, you meet with a case where a child has been attacked with a sudden fit of suffocation, and at once loses its voice, especially if you can get the history that the child had something in its mouth when the fit of suffocation came on, you must always suspect the presence of a foreign body in the larynx, and you will establish the diagnosis in some cases, at all events, by excluding other causes which might produce hoarseness of the voice. By this, I mean, that you would carefully examine the throat and take the child's temperature to exclude all inflammatory causes which might give rise to hoarseness. Let me record a couple of cases which illustrate this. I have on the table here a small piece of a brass ear-ring which I removed from a child's larynx. A little girl, aged seven, was brought to the hospital by its mother, with the history that the child had informed the mother that it had "swallowed" an ear-ring, which it had had in its mouth. This was all the history; no account of any fit of suffocation could be obtained, as the child was alone when the accident occurred. When I saw the child there was a

frightened, anxious expression of countenance. The voice was hoarse and croupy. The temperature was normal, and upon examining the throat it appeared to be perfectly natural. The child reiterated the statement that she had swallowed the ear-ring, which hurt her at the time, but stated that she was in no pain now. There was no cough, and her breathing was perfectly easy and natural. Air could be heard entering freely over both lungs. The child was placed under the influence of chloroform and an endeavor made to feel the foreign body with the forefinger, but without success; an attempt was also made to get a view of the larynx with the laryngoscope, but this was also unsuccessful. I therefore opened the child's larynx, and upon introducing a bent probe through the wound, towards the mouth, I at once felt it grate against some hard substance. I now introduced a metal female catheter through the opening, and with this dislodged the foreign body and pushed it upward into the mouth, where it was seized and extracted.

A second case which came under my care was of considerable interest and is well worthy of a brief notice. A medical man brought a little girl, aged five, into my consulting-room one morning, with the history that three weeks previously she had suddenly lost her voice, without any assignable cause. I examined her carefully, and could find nothing wrong with her, except that her voice was reduced to a whisper and was very hoarse in character. She breathed quite freely and naturally; her temperature was normal; she had no cough, and there was nothing wrong with her throat. At the time she was attacked with the aphonia she was not suffering from cold or cough; in fact, she was apparently in the enjoyment of perfect health. I had her placed under the influence of chloroform, in order to examine the upper aperture of the larynx with my fingers, but nothing could be felt. The irritation of the fauces by the finger produced violent efforts of vomiting, during which she brought up a piece of orange-peel the size of a three-penny piece. The next day her voice was entirely restored and she was hoarse no longer. The mother most positively assured us that the last time the child had eaten an orange was on the day she was attacked with loss of voice. There seems, therefore, no reason to doubt that the child had put a piece of the peel into its mouth, and that this had been inhaled and become lodged in the ventricle of the larynx and had caused the loss of voice; and, furthermore, it seems

probable that I dislodged or loosened it somewhat with my finger, though I did not feel it, and that then it was rejected in the act of vomiting.

We have, however, other means at our disposal to assist us in our diagnosis in these cases, and you will have gathered from my description of these cases what two of these means are,—viz., examination of the part with the finger and with the laryngoscope. Though sometimes nothing is to be felt with the finger, in other cases the foreign body can be easily felt. This was so in the case of the child aged two, from whose larynx I extracted this portion of rabbit bone. You will see that the bone is apparently the spinous process of a vertebra, with one of the laminæ attached. The child was admitted with the history that the day previously, while eating rabbit soup, she had suddenly choked and become livid. When admitted the breathing was labored and stridulous. She was placed under the influence of chloroform, and upon introducing the finger, the spinous process of the piece of bone could be easily felt projecting upward between the false vocal cords, thus interfering with the current of air and so producing the stridulous breathing. It was readily extracted with a pair of sequestrum forceps.

With regard to laryngoscopic examination, you will find that this affords an important aid to diagnosis in the adult, but its use is generally impracticable or impossible in children. They will not submit to the examination, which requires a certain amount of co-operation on the part of the patient. I have tried to make the examination after the child has been placed under an anæsthetic, but have never been able to obtain a satisfactory view of the parts. The new system of photography will no doubt be a most useful adjunct to our means of diagnosis in these cases. If the foreign body is a metallic one or a piece of bone, a skiagraph will at once not only indicate its presence, but also its position. I have not yet had an opportunity of testing it in foreign bodies in the air-passages, but in two cases recently in which coins were lodged in the œsophagus, the Röntgen rays at once revealed their presence and situation.

I think there is no question that if the surgeon is assured that there is a foreign body lodged in the ventricle of the larynx, he is bound to do his best to remove it. And this may generally be done by opening the larynx and dislodging the foreign body by some blunt instrument introduced through the wound. But this cannot

always be done, and then it must be removed by the operation of thyrotomy. I show you a piece of bone which was removed in this way by Mr. Holmes. You will notice that it is of considerable size, about three-quarters of an inch square, and that it has a very sharp projecting spine from one corner. It looks like part of the base of a rabbit's skull. It was found impossible to dislodge it in the ordinary way, and it was therefore removed by thyrotomy.

We pass on now to consider those cases where the foreign body has passed beyond the larynx into the trachea. Here the symptoms will vary according to the size and weight of the substance, for if it is of small size and of no great weight, it will float about in the trachea, moving upward and downward with the respiration, and will produce a very characteristic train of symptoms; but if, on the other hand, it is heavier, it sinks down to the lower part of the trachea, and the blast of air during expiration is not sufficiently strong to move the foreign body, and therefore these characteristic symptoms are absent. Of course, in both cases there are the immediate symptoms of obstruction due to spasm. When the foreign body is light and remains loose in the trachea, it constantly moves upward and downward with the exit and entrance of air, and every now and then comes into contact with the lining membrane of the air-tube and sets up a violent paroxysm of coughing. During this forced expiratory effort the foreign body is driven violently against the glottis and excites spasm, so that the patient becomes purple in the face, with protruding eyes and other symptoms of obstruction to the entrance of air; this is succeeded by a croupy inspiration, and the patient is relieved for a time. The attack is, however, succeeded by another and another. In addition to this, if the stethoscope be applied over the trachea, the foreign body may be heard, moving up and down and occasionally striking against the walls of the trachea. If the foreign body is larger and heavier, so that it does not float, it gives rise to a greater or less degree of obstruction to the passage of air, and may cause sibilant râles during either inspiration or expiration, or perhaps both. In this way we come to the conclusion that the foreign body is in the trachea; and now what is to be our line of treatment? I cannot but believe that you will be best consulting the safety of your patient by at once performing a tracheotomy. After the trachea has been opened, it is well not to explore the air-passages at once, but to keep the edges of the wound apart with blunt hooks,

or by sewing the edges of the incision in the trachea to the skin wound, and in a large majority of cases, where the foreign body is movable, it will be spontaneously expelled. I carry my mind back to my student days for an illustrative case. When I was dresser to the late Mr. Cæsar Hawkins, a little girl was admitted who was said to have "swallowed" a glass bead. The symptoms were those of a foreign body in the trachea, and shortly after she had been admitted she was attacked with urgent dyspnœa, and the house surgeon at once opened the trachea. The child was relieved, and fell asleep. She continued, according to the nurse's account, quietly sleeping throughout the night, and in the morning the glass bead was found lying in the bed beside her. The inference was that she had spontaneously expelled the foreign body, while coughing, through the wound during the night. Probably in those days nurses were not as vigilant as they are at the present time. If the foreign body is not expelled in a couple of days, then some means should be taken to explore the trachea and extract it. For in these cases it is probably fixed in the lower part of the trachea, and it will be convenient to reserve what I have to say on this subject until we have considered the symptoms which would arise if the foreign body is lodged in one of the bronchi, as the same treatment would apply to both classes of cases. When the foreign body enters one of the bronchi, the symptoms produced will depend to a great extent upon the size and nature of the body, and whether the bronchus is entirely occluded or not. In all cases there are the primary symptoms of obstruction, due to spasm produced by the irritation of the foreign substance passing over the glottis, and there is an absence of those symptoms which I have mentioned as indicating its presence in the trachea. If the bronchus is completely occluded so that no air can enter the lung, the normal vesicular murmur is entirely absent over the whole lung, and all vocal fremitus is lost. The respiration on the opposite side is exaggerated. The percussion note varies: at first it is normal, or in some cases there may be hyperresonance; but in a short time the lung becomes congested, and then there is diminished resonance and sometimes complete dulness over the whole of the chest. In many cases, however, the bronchus is not completely obstructed, and a small amount of air finds its way past the extraneous body; then the respiratory murmur will be noticed to be diminished, but not abolished; the resonance will probably be unaltered at first, and the side

of the chest on which the body is situated will be noticed to move less during respiration than the opposite side. Very often in these cases a whistling noise will be heared upon placing the stethoscope over the region of the bifurcation of the trachea, produced by the passage of the air through a narrowed chink between the foreign body and the wall of the trachea. Occasionally some body, such as a piece of nut-shell, may be so fixed that it has a sort of valve-like action and allows air to be forced out by expiration, but little or no air to be admitted during inspiration, and under these circumstances collapse of the lung takes place.

A curious case occurred under my care some years ago, and I here show you the preparation. It is the lungs and trachea of a little child. The trachea has been laid open from behind, and you will see a piece of the stem of a clay tobacco-pipe, measuring an inch in length, impacted in the commencement of the right bronchus, which it just fills. It was taken from the body of a child, aged two, who was admitted into the hospital with the history that, while sitting on its father's knee and playing with his pipe, it had bitten a piece off the end of it and had "swallowed" it. This was immediately followed by a severe fit of dyspnœa. When admitted into the hospital the child seemed to be in no pain, and could swallow freely. There appeared to be a certain amount of difficulty in breathing. Both sides of the chest were resonant throughout, and air could be heard entering both lungs, but the respiratory sounds on the right side were thought to be somewhat deficient. I performed tracheotomy, and a day or two afterwards made a careful exploration of the trachea and bronchi, but was unable to detect any foreign body. The child gradually sank and died on the ninth day. After death the base of the right lung was found to be hepatized and the left lung congested. The inference is that a certain amount of air found its way through the lumen of the piece of tobacco-pipe and thus destroyed the most valuable sign that we have in these cases,—the absence of the vesicular murmur. Occasionally the foreign body, if small, may pass farther down and occlude only one of the main branches of the bronchus; then there will be loss of breath-sound only in that part of the lung in which this branch ramifies.

We have now to consider the treatment to be adopted in these cases. In the first place, as in those cases where the foreign body is in the trachea, a tracheotomy should be done. The best plan is

then to stitch the edges of the incision in the trachea to the skin wound and wait for a couple of days before taking any further steps, for the foreign body may be spontaneously expelled. But if this does not occur at the end of this time, the trachea and bronchi should be gently and carefully explored with a probe, so as to try to ascertain the position of the foreign body. This will in all probability excite a severe attack of coughing, during which the foreign body, the position of which may have been altered by the examination, may be expelled. This was so in the case of the patient from whom this plum-stone was extracted. The stone was situated in the right bronchus, and a day or two after tracheotomy had been performed a rigid probe was introduced into the bronchus; this dislodged the stone and excited a violent fit of coughing, during which it was expelled from the wound. If this should not happen, the patient may be inverted, and at the same time sharply struck on the back over the situation of the bifurcation of the trachea, the edges of the wound being held as far apart as possible. This was what happened in the case of the late Mr. Brunel. While playing with his children, this half sovereign, which I now show you, and which he had in his mouth, was carried into his trachea. It was recovered forty days afterwards by inverting the patient on a movable platform which had been constructed for the purpose and at the same time striking the back with the hand. Tracheotomy had been performed some days previously. "After inversion, two or three efforts to cough followed, and presently Mr. Brunel felt the coin quit the bronchus, striking immediately afterwards against the incisor teeth of the upper jaw, and then dropping out of the mouth." Fruitless attempts had previously been made to extract the foreign body with the forceps which I show you, and which were specially made for this case. If this procedure fails on account of the foreign body being too firmly fixed, attempts must be made with forceps and probes hooked at the end to dislodge the foreign body. This is often a matter of extreme difficulty, the introduction of the instrument causing violent coughing, no matter how gently they may be used, and the surgeon is baffled in all his efforts.

It only now remains for me to say a word or two upon what will be the result if the presence of the foreign body is overlooked, or if it cannot be removed. At a variable time after its introduction, sometimes in a day or two, sometimes not for a considerable period,

inflammation is apt to be set up. A cavity is formed around the body in the substance of the lung. This is accompanied by purulent and bloody expectoration. The patient becomes hectic and develops symptoms resembling phthisis, and gradually dies in a few months of exhaustion. Occasionally after abscess has formed, and the foreign body has become loosened, it may be coughed up and the patient recover.

THE SURGICAL TREATMENT OF GALL-STONES.

BY JAMES F. W. ROSS,

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Hospital for Women; Associate Professor of Gynæcology, University
of Toronto.

———————

GENTLEMEN,—According to Greig Smith, to Petit is un-
doubtedly due the merit of having founded the surgery of the gall-
bladder. In 1733 he brought forward the subject, and ten years
later his most important articles appeared. The surgery of the gall-
bladder, however, remained as an unknown quantity until about the
year 1880; since that time a large number of operations have been
recorded. The surgery of the gall-bladder, itself, is fairly well estab-
lished, while that of the gall-ducts is as yet in a state of development.

INDICATIONS REQUIRING OPERATION.

When should we operate?

(*a*) In cases of recurring biliary colic from which the patient
is incapacitated for work, even though there is no jaundice or tumor.

(*b*) In cases in which the gall-bladder is enlarged, even though
no jaundice or great amount of pain is present.

(*c*) In cases in which we have a persistent jaundice with or with-
out pain, and with or without enlargement of the gall-bladder, and
in which we have symptoms similar to those of ague. If jaundice
is present and the gall-bladder is distended, a malignant growth will
frequently be found to exist.

(*d*) In cases in which we have empyema of the gall-bladder.
This condition may not be diagnosed before operation.

(*e*) In cases of peritonitis in the right hypochondriac region.
Such inflammation is usually ushered in by the sudden onset of pain.

(*f*) In cases in which we have evidence of suppuration in the
neighborhood of the liver or bile-ducts.

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(g) In cases in which we have a fistulous opening between a perforated gall-bladder and the abdominal wall.

(h) In cases in which an enlargement is felt in the neighborhood of the pyloric end of the stomach simulating carcinoma of the pylorus; and with the stomach dilated and the patient jaundiced an exploratory operation should be performed. Such a condition has been diagnosed as malignant disease of the stomach when the symptoms were all due to the impaction of a large gall-stone in the common bile-duct. In my own practice I have met with such a case; the incorrectness of the diagnosis of malignant disease of the stomach was only determined by the performance of a post-mortem examination; a stone an inch and a half long and three-quarters of an inch thick was then removed from the common duct. The stomach was dilated and the dilatation was due to the partial obstruction of the duodenum by inflammatory adhesions.

Murphy's classification of indications for operation is as follows: First, cholelithiasis, that is gall-stones, (a) in the gall-bladder; (b) in the ductus choledochus; (c) in the ductus cysticus; (d) in the ductus hepaticus; (e) in the diverticulum; (f) after ulceration into the peritoneal cavity. Second, cholecystitis, (a) empyema; (b) hydrops. Third, cancer of the pancreas. Fourth, neoplasms, involving the ducts. Fifth, carcinoma of the gall-bladder. Sixth, traumatism.

Great exhaustion rather contra-indicates operation. Patients suffering from malignant disease in this neighborhood are not in a favorable condition for surgical interference because they are cachectic and worn out, and they have added the condition of cholæmia, which predisposes to hemorrhage. I have had one such case in which there was great difficulty in controlling the hemorrhage from the wound. Mr. Mayo Robson has been in the habit of giving chloride of calcium before operation on these jaundiced patients to prevent this tendency to bleed. The chloride of calcium is supposed to increase the coagulability of the blood. I have made it a rule to ligate all points that bleed excessively in operating on jaundiced patients; pressure of the artery forceps is not sufficient to control this hemorrhage; arteries are liable to spout when reaction sets in.

We see reports in journals of cases in which gall-stones have been felt by external manipulation and yet no surgical interference advised. The ordinary reader is often misled by off-hand reports

of inaccurately recorded and observed cases. In such cases olive oil is administered to the patient each morning, mixed with mint-water; a warm bath is prescribed thrice weekly, and the bath kept hot by the frequent addition of hot water; barley water, to each quart of which two teaspoonfuls of bicarbonate of soda have been added, is given as a drink; a pint of this beverage is given daily, and then we are told that these patients who have been ill for years rapidly recover. And yet no physiologist has been able to explain the exact *modus operandi* of the formation of gall-stones. These cures are quite on a par with those of which we hear in connection with the advertisements of celebrated Spas.

It is very difficult for the physician to observe any single patient for a period of eight or ten years. A man may recover from all the symptoms of gall-stones for a prolonged period and may die of sudden perforation of the gall-bladder or some other complication that may suddenly arise. Many people suffer from gall-stones who are unaware of the fact until the ordinary biliary colic is produced by the passage of a stone down the ducts.

In an article read before the International Medical Congress in Rome, Mr. Mayo Robson says, "I hope the time is not far distant when it will be fully recognized that while cholelithiasis, so far as its causes and its early treatment are concerned, is distinctly a condition for medical treatment, it is both unjust to the patient and unfair to the profession to continue medical treatment until serious complications supervene or the patient is almost, if not quite, past relief, before the aid of surgery is invoked."

After frequent attacks of pain have been accompanied by frequent attacks of localized peritonitis, the duodenum and the liver and the gall-bladder become matted in one conglomerate mass. It is impossible to say when an operator may meet with such a condition. An inexperienced operator may, under such circumstances, fail to find out the exact condition present, and close the abdomen without having obtained any further information. It may perhaps be stated that no gall-stone is present, because, unless the stomach and duodenum are drawn down on the abdomen, the ordinary finger will not be of a sufficient length to reach the duct throughout its whole extent. It is difficult to detect a gall-stone at the bottom of such a mass of adhesions. On one occasion I was forced to open the duodenum so as to obtain a guide from within to the situation

of the common duct. In the duct I found three small stones, one of them (as is usually the case) partly disintegrated and the others smooth and faceted with every evidence of a recent migration into their new situation. The delivery of a contracted gall-bladder from dense adhesions, the peeling off of the omentum from the under surface of the liver, and the separation of the duodenum from the duct combined to make the operation one of the most formidable I have ever performed. With the portal vein behind, the hepatic artery behind and to the left, an incision into the common duct is frequently fraught with considerable danger; and yet if a stone is lodged in this locality exploratory operation without its removal is an unsurgical procedure, though occasionally necessitated, owing to the force of circumstances.

In Mr. Mayo Robson's excellent address in another place he says, "I think such surgical work should be undertaken only by those who have had experience in abdominal surgery and who have witnessed or helped in several operations of this kind." I would add to this, that even the abdominal surgeon requires a special experience before he feels thoroughly familiar with the surgery of the gall-bladder and ducts.

A case was related by Mr. Hyde Hills and Mr. Douty before the Cambridge Medical Society, for the relation of which I admire these gentlemen; many surgeons would do well to profit by their example. A lady, aged sixty, had suffered for some years with biliary colic and jaundice; cholecystotomy was performed by Mr. Douty, and the gall-bladder was found contracted, contrary, he says, to his expectations. According to my experience in such cases, this contraction is the condition most frequently present. The gall-bladder was small, shrivelled, and contracted; no stones could be felt in the gall-bladder or in the cystic or biliary ducts. The abdomen was closed and nothing further was done. The jaundiced condition continued, and the patient died four days after operation. At the post-mortem examination a large hour-glass-shaped pigmented stone was found in the common bile-duct; this could be moved up and down, and from the common duct into the hepatic duct. A narrow stricture was found about one-quarter of an inch from the entrance of the duct into the duodenum. This case demonstrates that the greatest care is required when such cases are explored in order that a hidden

stone may not be overlooked; and with this care must be combined a large amount of experience in abdominal work.

If you will read the reports of such cases as the following, you will see the dangers to the patient when he is placed in inexperienced hands. In this case there was a pear-shaped swelling on the outer side of the rectus muscle. An incision three and one-half inches long was made, the gall-bladder was seen in the wound, and the fluid, which was clear and limpid, was withdrawn by an aspirator. The gall-bladder was then opened, a gall-stone was found loose in the cavity and was removed, and another was found firmly impacted in the cystic duct. A long time was spent in fruitless efforts to dislodge or break up the stone, but the patient had finally to be sent back to bed with the stone remaining in the duct; the gall-bladder was stitched to the skin. Three days later the original incision was enlarged, the stone was felt, and an endeavor was then made to split it with a needle stuck through the duct; this failed; the stone was then crushed and the fragments removed. Thanks to an all-wise Providence, the patient recovered, whether to suffer subsequently from a fistula or not is not stated. Such a case is reported in a well-known journal.

My own observations in connection with these cases bear out the observations of others; first, in cases in which we have jaundice accompanying gall-stones no tumor, as a rule, will be felt; second, that in cases in which we have jaundice accompanying malignant disease a tumor of the gall-bladder is usually present. A patient suffering from spasmodic pains in the right hypochondriac region accompanied by intermittent rises of temperature, with or without intermittent attacks of jaundice, and in whose abdomen no tumor can be felt, will be found, as a general rule, to be suffering from a gall-stone or gall-stones impacted in the common duct. Such a condition will justify early exploratory operation. The surgeon must remember that intestinal obstruction may suddenly occur in a patient who has previously suffered from gall-stones; over one hundred such cases have been recorded, and the small intestine is the portion of the gut in which the gall-stone is usually found obstructing its calibre. Nature helps us out in some cases, because a fistulous opening may be formed by a process of ulceration between the gall-bladder and the intestine, but it is scarcely wise for the surgeon to wait for nature. Sir William Gull has said "that nine times out

of ten nature does not want to cure the man; she wants to put him in his coffin."

Occasionally operators may find no gall-stones because no gall-stones are present. I have operated on two such cases. In one the gall-bladder was found distended and filled with fluid, and the fluid could be readily forced out into the duodenum by pressure. No adhesions were found and nothing abnormal could be made out either in the cystic or common bile-ducts. The patient suffered from attacks simulating attacks of biliary colic. If stones passed down they must have passed directly from the liver, through the common duct, into the duodenum without becoming lodged in the gall-bladder. I saw an eminent English surgeon open the abdomen of a lady suffering from similar symptoms, but no gall-stones were found. If, however, we take a number of cases suffering from paroxysmal pain in the region of the liver with intermittent fever, and without jaundice, and without enlargement of the gall-bladder, we will find gall-stones in a majority of them. My other case was that of a man who had suffered from frequent attacks of spasmodic pain, for which he had required a large amount of morphine. He looked somewhat like a neurotic, but a distinct enlargement could be felt below the edge of the liver and closely simulated a distended gall-bladder. He localized his pain over this point. I opened the abdomen and found a peculiar elongation of the middle lobe of the liver; it reached so far below the border of the ribs that, with the short incision that I had made just below the cartilage on the right side, it was difficult to reach its lower edge with the finger. It was turned up into the wound, and the gall-bladder was found lying beneath it; no stones could be felt, and the gall-bladder was not distended. I have watched the patient carefully since, and have concluded that his condition is one of hysteria; that he is lazy and does not care to work. This peculiar lobulated condition of the liver has been remarked in other cases by other observers. I have seen it in one case operated on by another surgeon.

VARIOUS LOCATIONS OCCUPIED BY GALL-STONES.

The accompanying drawings show the various situations that may be occupied by gall-stones. First, a stone may occlude the cystic duct and produce distention of the gall-bladder; second, a stone may be found in the hepatic duct; third, a stone may be found

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Stone in the common duct.

GALL BLADDER

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Stone in the cystic duct.

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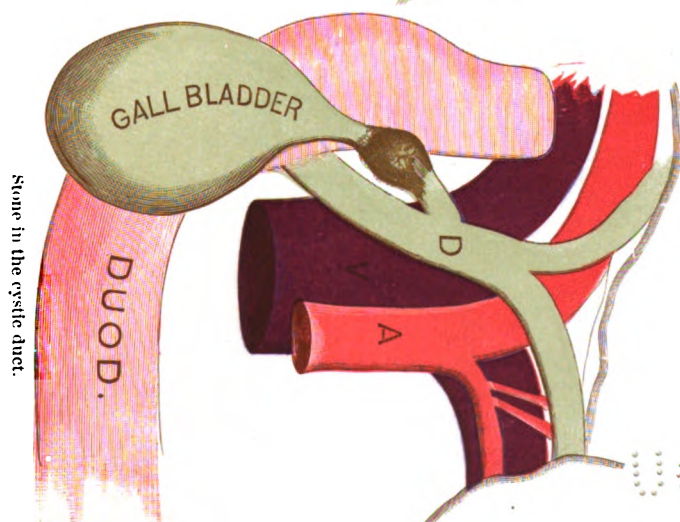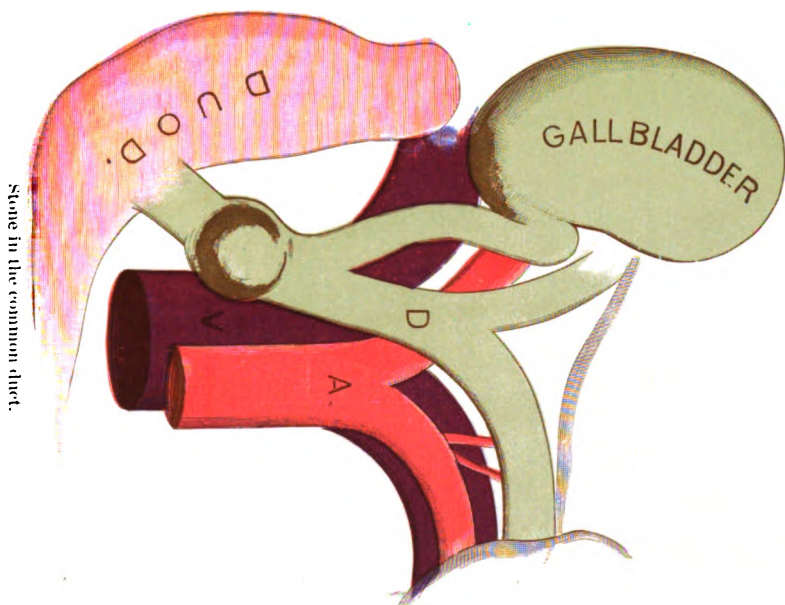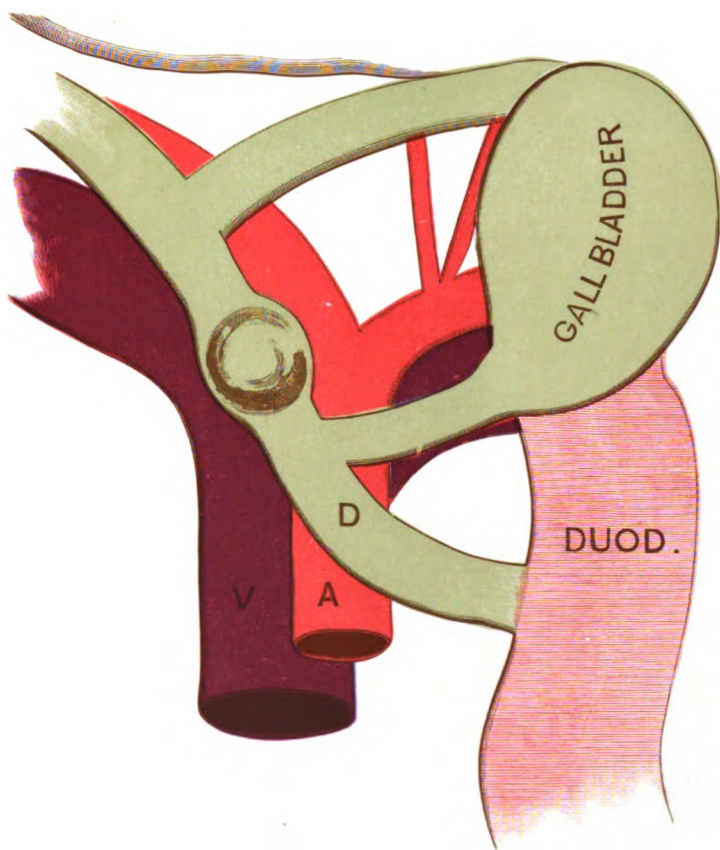
Stone in the hepatic duct.
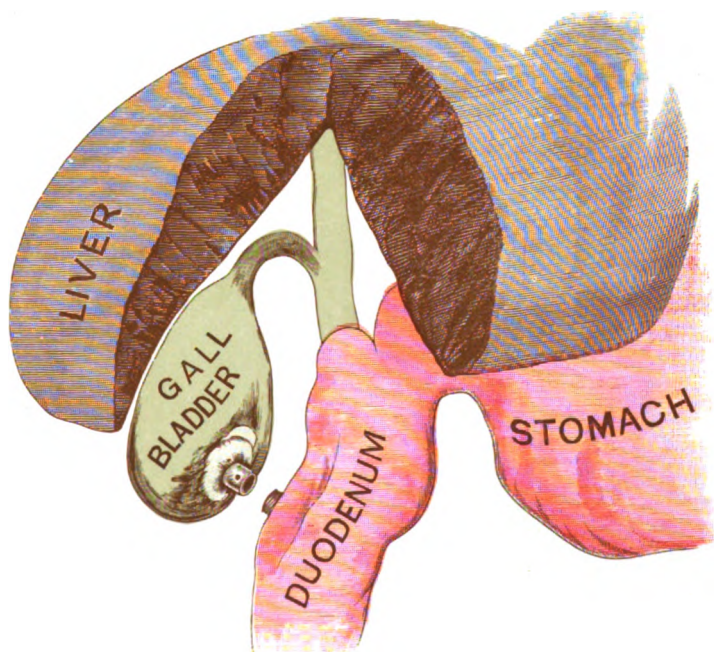
Gastro-intestinal anastomosis with the Murphy button.
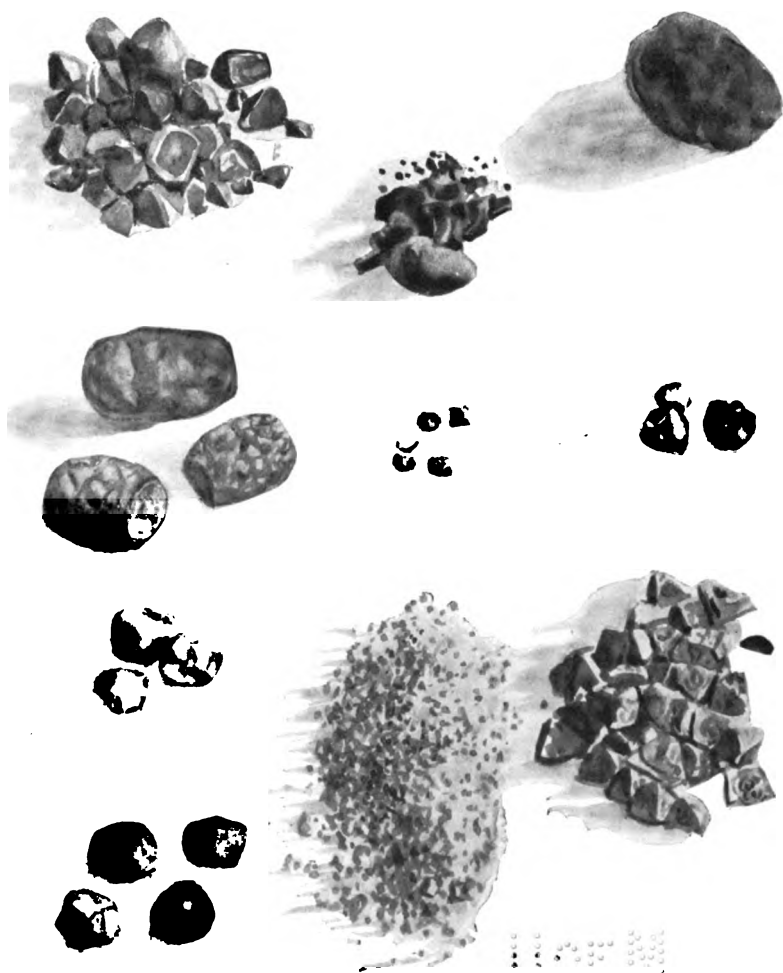
Various gall-stones removed by operation.

in the common duct; fourth, stones may be found free in the gall-bladder with or without any obstruction of the ducts; fifth, gall-stones may be found in the substance of the liver; sixth, stones may be found in the gall-bladder, and cystic, common, and hepatic ducts at one time, placed side by side in a row like peas in a pod as in one case recently operated on by the writer. The common duct was opened and the stones were "milked" down by the fingers, and removed one by one until the hepatic, cystic, and common ducts were cleared. The patient recovered. It must be remembered that abscess may be found in the substance of the liver, and that such an abscess cavity may contain many gall-stones. I have seen half an inch of normal liver tissue cut through to reach such an abscess. Aspiration of such abscesses should never be resorted to. I would allow no surgeon to put an aspirating needle through the skin into my liver or into the liver of any friend if I could prevent it. Sounding for gall-stones is not to be recommended. A small trocar is the proper instrument to use, and this should only be used after the abdominal cavity has been opened, unless there has been a neglect of surgical procedures for such a length of time that the abscess has begun to burrow through the abdominal wall and is pointing on the surface. If pus is found, direct incision should be made through the liver substance and the abscess cavity should be explored with the finger in search of gall-stones. The danger of hemorrhage from such an incision is more imaginary than real; the cavity can be packed and the hemorrhage will cease. The capsule of Glisson may then be stitched to the parietal peritoneum and a large drainage-tube placed in the cavity. If this tube is frequently emptied by suction, the danger of the extravasation of fluid into the peritoneal cavity will be minimized. I have recently removed about three thousand stones from the gall-bladder; they looked like Curtis & Harvey No. 10 gunpowder.

METHODS OF OPERATION.

Before entering upon the discussion of the individual operations it is necessary that we should consider the general subject.

A patient suffering from profound cholæmia will not tolerate the shock of a prolonged operation. I believe, therefore, that in some cases in which the patient is found in this weakened and poisoned condition it will be advisable to first relieve the jaundice

by performing rapidly a simple operation,—namely, cholecystotomy. If the gall-bladder is distended and filled with bile this can be readily done, but, in case of obstruction of the common duct from stone, the gall-bladder is usually contracted. This might lead us to believe that the obstruction is above the junction of the cystic and hepatic ducts, or, in reality, in the hepatic duct itself; but if a leak exists along the side of the stone and the gall-bladder is able to force on the bile, if the surgeon is fortunate enough to meet with a case in which the gall-bladder is distended, he can open it and stitch it to the abdominal wound, drain the bile externally, and thus relieve the jaundice. I did this in one case. In two weeks after the jaundice had been relieved by cholecystotomy I operated again and removed a stone from the common duct by direct incision. The patient made an excellent recovery though sixty years of age. The operation was an extremely difficult one, and I am satisfied that the patient would not have recovered if subjected to such a severe procedure while jaundiced.

Or, the operation of cholecystenterostomy may be performed, and in this way the jaundice will be permanently relieved. From what I have seen of pyæmia produced by ulceration of the gall-ducts as a consequence of impaction of gall-stones, and from what I have seen of the intermittent fever and intermittent pain and ill health produced by this condition, I was led to believe that the simple removal of the jaundice by this operation would not prove of permanent benefit to the patient; but after having side-tracked the bile from the gall-bladder to the colon in one case with the stone still *in situ* in the common duct, I have changed my mind. The patient is in excellent health. The stone, no doubt, disintegrates after the bile ceases to flow over it. It is not ideal surgery to divert the bile into another channel and leave the stone in its bed. It may be better for the patient if the stone can be removed after the general health has been improved. In cases of jaundice, such as those referred to, the skin was raw in places from the patient's attempts to relieve the pruritus by scratching. They also suffered from frequent epistaxis and bleeding from the gums. It will remain to be seen whether a secondary operation can be performed as readily after a new attachment has been formed between the gall-bladder and the abdominal wall. In my case I did not disturb the attachment of the gall-bladder to the skin at the second operation, but left the fistula still un-
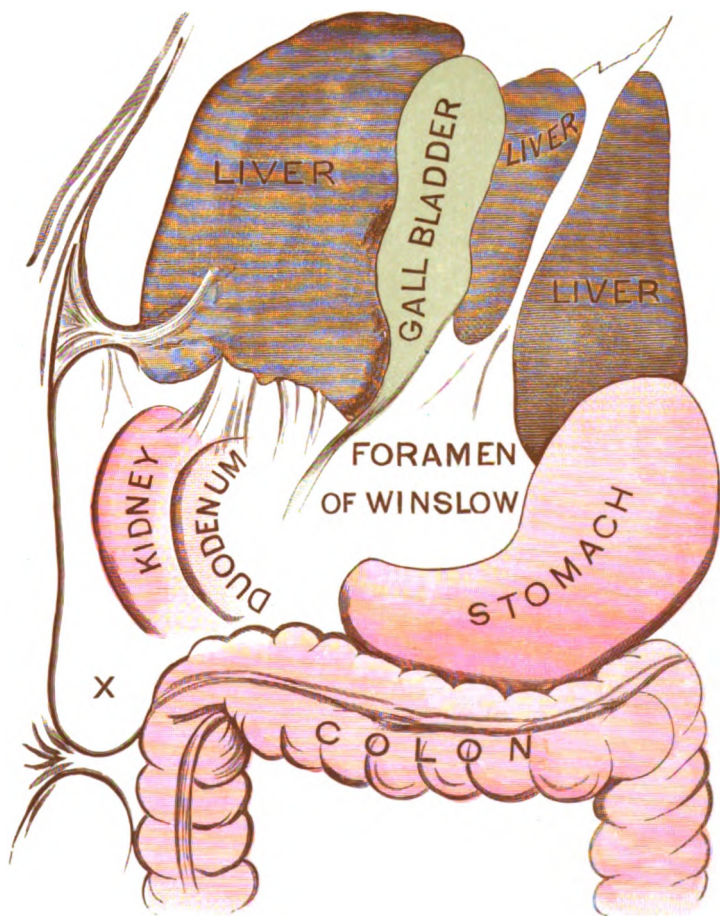
X. Pouch in right hypochondrium.   (After Morison.)

closed in order to minimize the risk of leakage from the incised common duct.

In cases in which the gall-bladder cannot be brought to the surface, and cannot be anastomosed with the intestine, even though the patient be weak and jaundiced, I believe that the mere opening of the abdomen, without further surgical procedure, is not a justifiable operation, and, further, that even though the patient may die subsequent to operation, an endeavor should be made to remove the calculus, so that the sufferer may be given a chance, perhaps a poor one, of restoration to health. Such operations are desperate, and the mortality will necessarily be high. This high mortality must, however, be placed at the door of those who procrastinate, and not at the door of the surgeon who operates.

INCISION.

I am firmly convinced that the best incision for all operations for the removal of gall-stones is the transverse incision extending from the inner edge of the rectus muscle on the right side outward about one inch below the edge of the cartilage of the ribs on the right side. The incision may be made at first only three or four inches in length, and afterwards enlarged if it is found necessary. In my first operation I used the vertical incision, and was obliged to make another at right angles to it in order to suture the cystic duct after removing a stone from it by incision. The incision should always be made far enough below the ribs to avoid the edge of the liver; if this is not done the edge of the liver will be in the operator's way during the subsequent manipulations.

In a very interesting article, Mr. Rutherford Morison has gone carefully into the anatomy of the right hypochondrium, and has considered it in connection with the operation for gall-stones. He describes the pouch that is well known to exist in this locality as bounded above by the liver, externally by the lateral ligament, internally by the spine, and below by the mesocolon; a pouch that will contain nearly a pint of fluid. I have here a diagram copied from his paper to show this pouch and to represent the point at which he considers a drainage-tube should emerge subsequent to any operation on the gall-ducts in which an extravasation of bile is feared.

The drainage of this pouch—the hepatic pouch we may call it —is certainly an important matter. In one case that I mentioned

above I elevated the foot of the bed to prevent the extravasation of bile into the general peritoneal cavity after an opening had been made into the common duct. The wall of the duct was so friable that it would not hold sutures. Free external drainage from the front was afforded, but, notwithstanding this fact, the general peritoneal cavity became flooded with bile and a fatal peritonitis ensued.

To place a drainage-tube in the locality indicated by Mr. Morison, it is necessary that the oblique incision should be adopted. He believes that hernia occurs less frequently after the transverse than after the perpendicular incision.

TWO CASES OF EXCISION OF HEAD OF HUMERUS, FOR SUBSPINOUS DISLOCATION; AMPUTATION AT KNEE-JOINT, TWO CASES; LUMBAR DRAINAGE AFTER REMOVAL OF APPENDIX.

BY JOHN H. BRINTON, M.D.,

Professor of Practice of Surgery and Clinical Surgery in the Jefferson Medical College of Philadelphia.

GENTLEMEN,—I will now bring before you two cases of injury of the shoulder-joint, unusual in character, and both of which demanded operative interference.

The first of these, I. H. T., a man aged thirty, from whom this head of the humerus was removed, was injured in a trolley-car accident between Lancaster and Carlisle, Pennsylvania, on the 9th of August, 1896. At the same time two or three persons were killed and several injured. The car in which this man was seated jumped the track, toppled over, and I understand was pulled some distance partially on its side. The patient, to protect his face, raised his arm and hand, his elbow projecting through the car window. In this position, he says, he was dragged some seventy feet, the arm violently brushing the ground and a bank of earth beside the track-way. When extricated, the left shoulder was swollen, deformed, painful, and useless.

He was brought to the Jefferson Hospital by Dr. H. G. Hassenplug, of Lancaster, Pennsylvania, on October 15, 1896. I found, on examination, that the left shoulder was broadened transversely, and the head of the humerus could be recognized as a hard round mass, behind the glenoid cavity, resting upon the upper part of the infraspinous fossa, immediately below the centre of the spine of the scapula. It was fixed in position, immobile, and the axis of the arm was directed away from the chest. The normal gliding motions of

the scapula on the thoracic wall could be obtained. There was sub-acromial flattening, with apparent projection of the process.

Examination by the X-ray demonstrated, as you can plainly see in this skiagraph, subspinous dislocation of the head of the humerus, with external rotation and apparent bony deposit. A line of fracture could be detected below the tuberosities, and by movement of the lower arm vague crepitus and motion could be elicited, although such attempts caused much pain.

On October 24 I exposed the head of the humerus by a U-flap of the deltoid. I found, as I had expected, that the head had been luxated backward beneath the spine of the scapula. A tolerably firm bony ankylosis had been established between its posterior sur-face and the infraspinous fossa, at the line of fracture, which was oblique and just below the tuberosities. The head of the humerus was tightly held down by the articular tendons, and from the com-bined effects of position, bony deposit, and muscular strapping was practically immovable. I therefore divided the osseous adhesions with a chisel, and excised the head and bone, as you here see in the specimen, down to the line of fracture, at the same time smoothing the upper end of the lower fragment. The fibres of the deltoid were drawn together by buried catgut sutures, a drain inserted, and the external wound closed by silkworm gut. The patient made an un-eventful recovery, and is now rapidly recovering as satisfactory mo-tion at the false joint as could be expected. The deltoid action will doubtless be much impaired, but, as you see, the rotation of the hu-merus will probably be fairly good.

A second instance of subspinous dislocation of the humerus, strikingly similar to the preceding, occurred in the case of this young girl, C. V., aged eighteen, and unmarried, who on February 27 fell down a crooked flight of stairs, striking on her shoulder. She was brought to this hospital by Dr. McMasters, of Ridley Park, Pennsylvania, on the following day. I then found that the left shoulder was rounded and much swollen, but the head of the hu-merus could be recognized beneath the spine of the scapula, and the glenoid cavity was empty. There was much pain in the shoulder and armpit, and a fracture could be detected just below the tuber-osities. The upper end of the lower fragment was drawn upward, below and in front of the coracoid process, and the axis of the arm was directed away from the chest wall. The X-ray picture, or skia-

graph, of this case, which I here show you, brings clearly out the essential features of this injury,—viz., subspinous dislocation with transverse fracture below the tuberosities, probably, as I judged from the age of the patient, an epiphyseal separation.

On March 3, 1897, a longitudinal incision was made downward from the acromial tip, parallel to and through the deltoid fibres. The head of the humerus was then exposed and removed down to the junction of the epiphysis with the diaphysis, at which line fracture, or rather separation, had taken place. As in the preceding case, the head of the bone was firmly held in its abnormal position by the articular muscles. The deltoid incision was drawn together by a buried continuous suture of kangaroo tendon, drainage-tube inserted, and the external wound closed by interrupted sutures of silkworm gut. On the fourth day afterwards the temperature rose to 103° F., and suppuration ensued in the track of the kangaroo suture. The wound was opened at its lower part and thoroughly irrigated by sublimate solution. After this the discharge gradually decreased, the patient slowly convalesced, and on April 28 was discharged from the hospital to her home, the wound having closed.

To-day you see the condition of the parts. Cicatrization has taken place; the deltoid, which seems to be divided into an anterior and posterior part, is gradually recovering power, and the motions at the false joint are being developed, and are painless.

Subspinous dislocations of the humerus, accompanied by fracture, are, I think, comparatively rare, and not many have been reported. I bring these two cases before you because of their rarity, and also to illustrate the value of the X-ray in clearing up an obscure diagnosis. As you have observed, a remarkable similarity exists between these cases in three respects,—first, as to the position of the head of the humerus; second, the locality and direction of the fracture; and, third, the muscular tension.

I may add a few words regarding the treatment. In both cases the head of the humerus was removed down to the line of fracture. This was done because I was convinced that, even if the head of the bone might be reduced, it could only be done and retained in place at the destructive expense of the tendons of the articular muscles. Moreover, the union of the fracture would necessarily be incomplete, in consequence of the impaired vascular supply, and sooner or later necrosis of the head must follow. Even a supposable partial

union would be accompanied by impaired motion; and ankylosis, with loss of the usefulness of the limb, would be an almost certain result. The involvement of the circumflex nerve, the strands of the brachial plexus, and the great pain, increased by every attempt at motion, were also important factors in determining the treatment. Influenced by these considerations, and after consultation with my colleagues, I arrived at the conclusion that better motion at the shoulder and a more speedy recovery would be obtained by the excision of the head of the bone.

I will next direct your attention to two cases of *amputation at the knee-joint*. The first of these was done by me, nearly thirty-eight years since, on this man, W. W., then a boy of eleven years of age. In November, 1859, he was brought into St. Joseph's Hospital with his right leg hopelessly crushed from a railroad accident. He had lost much blood and was in a state of great shock. Fearing to intensify this shock by an amputation of the thigh I removed the limb at the knee-joint. This was, I think, the second knee-joint amputation ever performed in Philadelphia, the first having been the case of Rachel Morris, successfully operated on in 1841 by the elder Pancoast, at the Philadelphia Hospital, and reported in his "Operative Surgery." In the case of the man before you I operated by an anterior short flap and a posterior long flap, the head of the gastrocnemius muscle being dissected away. The condyles of the femur were left, also the semilunar cartilages and patella. The boy made a good recovery, and has used an artificial limb on the stump for nearly thirty-eight years.

I beg you to look at the stump. You observe that it is well rounded and firm, and that the patella has not ascended high on the thigh, in consequence of the preservation of the fascial capsule, which is not divided when the condyles, in whole or in part, and especially the patella, are left. The power of internal rotation and adduction is remarkable, and is due to the preservation of the insertion of the tendon of the adductor magnus upon the bony tubercle, above the inner condyle of the femur. This stump has never been sore or tender, but has been in every respect serviceable for this long period of years.

The second case of knee amputation (whom I met at the hospital door this morning) was performed fifteen years ago by an operator whose name I do not know. The ends of the condyles are flattened,

and appear to have been sawed off, but the adductor tendon has been preserved, and the rotatory movements of the stump and its strength have been well preserved. This man has never permanently worn an artificial leg; he says the one he had hurt him. I advised him to consult with his fellow-patient whom you have just seen, who will doubtless give him more practical advice in this matter than either you or I could do.

While on the subject of amputations at the knee-joint, I may add that I have done or assisted in a great many of these. The operation is to be distinguished from *amputation at the knee,* in which the lower portion of the cancellated femur is sawed across, and the medullary cavity sometimes opened. I believe that the amputation of the knee-joint possesses many advantages, the greatest of which are its freedom from shock, the lessened risk of infection, and the great value of the resulting stump, especially in its powers of rotation and adduction. In doing it, however, it seems to me that certain precautions should be preserved. I think it is better to operate by two flaps,—a short anterior and a long posterior, both of them to consist only of the skin and superficial fascia. If the posterior flap contain the heads of the gastrocnemius muscle, these are apt to perish, as the small arteries which supply them are divided on a level with the joint by the knife in the disarticulation.

Another point in this knee-joint amputation is the tendency to reactionary hemorrhage, which so often occurs, no matter how many vessels are ligated at the time of operation. The vessels of the popliteal space are the superior muscular, the superior external and internal articular, the azygos articular, the inferior external and internal articular, and the sural or gastrocnemial. When the disarticulating knife passes through at the level of the joint, the last four, and sometimes the azygos are divided and tied. If the azygos is not divided and tied, the reactionary hemorrhage is apt to occur from the tissues *within* the joint which it supplies, and also from the more superficial tissues, supplied by the upper branches from the popliteal. The ligation of all smaller vessels at the time of a knee-joint amputation demands great care to avoid the troublesome occurrence referred to. The absence of any great shock in this operation is remarkable, and I think results from the division of tendinous rather than muscular structures. The popliteal nerve, of course, should be cut short.

I believe that in many cases amputation at the knee-joint, or, if necessary, modified so as to be at the knee, will take the place of thigh amputation higher up. The lessened shock which knee amputations produce, the immunity of the medullary cavity of the femur, the diminished risk of infection, and the more serviceable resulting stump can but be potent factors in advancing the claims of these operations, which up to this day have been tardily recognized.

APPENDICITIS; FECAL ABSCESS; OPERATION; DRAINAGE THROUGH A LUMBAR INCISION.

Here is a patient, a man thirty years of age, upon whom I operated about four weeks ago for appendicitis. The appendix was found to be sloughing at its base, and a large fecal abscess had formed posteriorly. The appendix was removed and the cavity of the abscess thoroughly emptied and flushed. Fearing that drainage through an anterior abdominal wound might prove ineffectual, a free incision was made through the right lumbar region just above the crest of the ilium with my left index-finger pressed to the bottom of the abscess. A large rubber drainage-tube was then carried through the anterior abdominal and posterior lumbar opening. Anteriorly it was surrounded by iodoform-gauze packing. The patient made a rapid and absolutely uneventful recovery, and almost the entire drainage was effected through the posterior opening. Both openings, as you see, are now healed. It seems to me that in many cases of appendical operation the establishment of lumbar drainage may prove of value. It can be readily made, and is, I think, of wide application.

OPERATIVE DIAGNOSIS OF TUMORS.

CLINICAL LECTURE DELIVERED IN THE CHARITY HOSPITAL.

BY EDMOND SOUCHON, M.D.,

Professor of Anatomy and Clinical Surgery, Tulane University, New Orleans, Louisiana; Fellow of the American Surgical Association.

GENTLEMEN,—By operative diagnosis I mean the recognition of the features of tumors which it is necessary to know to properly treat them by operation. Tumors small and large are among the most common affections that you will meet in your surgical practice. They are so very numerous—some seventy in number—that the mere thought will surely bewilder you unless you possess a methodic guide to their understanding.

It is one of the most difficult things in surgery to diagnose accurately the true nature of a tumor. The most successful diagnosticians are oftenest those who diagnose the most frequent tumor of a group, but usually they cannot give other reliable, tangible reasons upon which their diagnosis is based. However satisfactory it would be to know positively the true nature of a tumor before operating, it is not, fortunately, absolutely necessary in order to properly treat it. Some tumors are easily recognized from their appearance, shape, location, fluctuation, density, etc. Advanced tumors, such as carcinoma with ulceration and infected glands, are diagnosed on sight. *The great majority of tumors cannot be cured without removal; but very few should not be removed. So that the point to decide in the presence of a tumor is whether the tumor under consideration should be and can be removed or not, and not so much what is its true nature. This will be determined later after the removal and the prognosis is established.*

It is well to inform the patient's family or friends of the possible dangers and complications of the removal of a tumor in a dangerous region, and, after the removal and the diagnosis is established, of the

chances of the return of the tumor. The patient should also be told the truth, because he may not wish to take the risk, but this should be done with care and tact.

Tumors are either gaseous, fluid, or solid. Percussion will reveal gaseous tumors. The exploring needle will tell if the tumor is liquid or solid. Soft tumors with contents too thick to flow through a large needle are included among the solid tumors.

In using the needle care must be taken to use one not less than two millimetres in diameter; the ordinary needle of a hypodermic syringe is so small that if no liquid is drawn through it, it is not safe to say that the tumor is not liquid. When pus is thick it will not flow through such a needle. The syringe should be large and in the best of condition, including the piston and all the connections. The instrument should be tried before using and should also be thoroughly asepticized.

The exploring needle is far superior to palpation and fluctuation to determine whether a tumor is liquid or solid. Some solid tumors are soft and give a sensation of false fluctuation which cannot be settled except by the use of the needle. Some tumors are so manifestly hard that the nature of their contents is easily determined, as a rule; but all clinicians know that such tumors may have central fluid contents which the needle alone can reveal. Many cases are on record of subchronic or chronic abscesses, especially in the mammæ, where the surface is hard and indurated and the interior filled with pus.

Solid tumors are all those whose contents will not flow through the large needle with syringe attached.

The needle is not infallible, but it is more reliable than any other means.

In some cases it may be necessary to resort to a small exploratory incision if the course of the tumor resembles that of a chronic abscess, giving a negative result with the needle. Sometimes even an extensive exploratory incision in solid tumors may be called for to decide whether extirpation or amputation of the limb should be performed.

The classification of tumors in general that follows is based upon their clinical features. The word tumor is accepted here not only in its histologic meaning, but in its broadest clinical and practical significance, meaning a circumscribed swelling of any kind or nature

(except a fracture or a dislocation), such as students meet them and have to recognize them and deal with them. This is surely an imperfect definition, but it answers all practical purposes.

Gaseous tumors are: Emphysema, circumscribed, traumatic, connected or not with the air-passages; pharyngocele, œsophagocele, laryngocele, tracheocele, pneumatocele, enterocele.

Liquid tumors formed of serosity or the like are: Cystoma, serous, synovial, tendinous, and articular (ganglions), mucoid, bursal (hygroma), sebaceous (oily), dermoid (oily), hydatid.

Liquid tumors formed of blood and serum are the following: Hæmatoma, liquid, traumatic, or spontaneous; varix, in group or the ampullar variety; angioma; cystoma, sanguineous; aneurism, traumatic, idiopathic, recurrent, arterio-venous, cirsoid.

Liquid tumor formed of lymph is a lymphangioma.

Liquid tumors formed of pus are: Cystoma, purulent or chronic abscess, or abscess, migratory, idiopathic or symptomatic of tubercles, etc.

Solid tumors comprise the following: Foreign bodies forming tumors (encysted balls), parasites forming tumors, tuberculoma, syphiloma (gumma); glanders, leprosy, etc.; inflammations; cellulitis, circumscribed, chronic or subchronic, indurated only,—i.e., without any pus; lymphadenitis, chronic.

Tumors proper, originating from the skin specially, are as follows: Comedo, keloid, primary, and recurrent, papilloma, cystoma sebaceous, dermoid hard. Tumors originating from the deeper structures are: Hæmatoma clotted or solidified, from contusion, rupture of muscle, injury to blood-vessels, cured and unabsorbed aneurism; myxoma, fibroma, lipoma, myoma, chondroma, osteoma, angioma hardened. Lymphoma present several varieties: Lymphoma, inflammatory or chronic,—i.e., lymphadenitis, chronic; lymphoma, simple, or adenia or lymphadenia,—i.e., a pure hypertrophy or hyperplasia; lymphoma, strumous, lymphoma, tuberculous, lymphoma, syphilitic, lymphoma of Hodgkin's disease, or leukæmia, lymphoma, malignant, lymphoma of glanders, etc.; adenoma or glandular tumor springing from a gland or resembling a gland; adenoid tumor, formed of adenoid tissue, such as exists usually in the pharynx; neuroma, sarcoma, simple or melanotic, endothelioma; epithelioma, carcinoma (encephaloid, simple or colloid or melanotic, scirrhus); cyst, sebaceous (solid), dermoid (solid); teratoma.

Tumors special to regions or organs are the following: Cranium: meningocele, encephalocele. Spine: meningocele. Neck: salivary cysts, salivary calculi, pharyngocele, œsophagocele, laryngocele, tracheocele, aberrant goitre, pneumatocele (in the supraclavicular region). Chest: pneumatocele. Abdomen: ventral hernia, intestines, epiploon, spleen, kidneys, ovaries, testicles, bladder, biliary cysts, and calculi in gall-bladder or ducts; enteroliths; renal calculi. Floating organs: kidneys, spleen, ovaries, liver, pancreas. Inguinal region: hernia, ectopic testicle. Crural region: hernia of intestines, epiploon, ovaries, tubes, bladder. Perineal region: urinary cysts, urinary calculi, prostatic cysts and calculi. Scrotal region: teratoma, syphilitic testicle. Phantom tumors are those which exist only in the imagination of the patient.

The regional symptoms or conditions of the neighboring organs, skin, lymphatic glands specially, should be well considered, as they may contraindicate the operation. Also the general symptoms or condition of the organs at large, specially with regard to the generalization of the tumors or of cachexia.

The tumors not to be extirpated must be diagnosed with the utmost care; no pains must be spared to avoid the possibility of removing a tumor which could be cured without an operation, or which would not be cured by it. This must be thoroughly considered in the study of each region.

The *gaseous tumor not to be extirpated* is emphysema circumscribed. There are other gaseous tumors which are not to be extirpated, as a rule, such as some varieties of pharyngocele, laryngocele, tracheocele, pneumatocele, enterocele not gangrenous. Percussion and the exploring needle reveal the nature of gaseous tumors. Circumscribed emphysema is recognized also by its characteristic crepitus. Pharyngocele, laryngocele, tracheocele, pneumatocele ordinary are reduced by pressure; violent respiratory efforts reproduce them; pneumatocele follows the respiratory movements. Enterocele, not strangulated, is also reduced by taxis and is reproduced by straining; when strangulated, the previous history of the case, the tympanism, and the vomiting clear the diagnosis.

The exploration with a proper needle and syringe will tell if the tumor is liquid or solid.

The following are the *liquid tumors which should not be extirpated:* Cystoma, tendinous, riziform; liquid hæmatoma, chronic

abscess, recent aneurism. Liquid hæmatoma follows blows or contusions, punctured wounds, or incised wounds, when the lips have lost their parallelism; they may be due to a cured aneurism; they should be left alone unless they cause pressure symptoms or unless they are too long in dispersing; then they should be aspirated; if they reproduce, they should be incised early; they need disinfecting and a drainage-tube with or without a supplemental opening at the most dependent point. Chronic abscess may be treated, first, with injection of iodoform (ethereal or mucilage), or by incision, disinfection, and proper drainage; when they resist this treatment, the mucous membrane of the interior should be curetted; when possible the membrane should be extirpated. Recent aneurisms present the characteristic pulsation with expansion, complete reduction by pressing on the tumor or on the artery above, and freedom from the bone. They should not be extirpated before trying milder means.

The following are the *solid tumors which should not be extirpated:* Circumscribed cellulitis, subchronic or chronic, indurated only,—*i.e.*, without pus; lymphadenitis, chronic; comedo; hæmatoma, clotted; lymphoma, strumous, recent; lymphoma of Hodgkin's, without pressure symptoms; lymphoma, tuberculous, recent; lymphoma, syphilitic, recent; gumma, recent; hæmatoma, solidified in dangerous regions; salivary tumor with calculus; pulsating sarcoma.

Comedones are characterized by small elevations of the skin with a black depressed centre; they should be treated by squeezing or by expression.

Cellulitis, indurated with no pus, is diagnosed by its history or by the fact that it is always painful by pressing it between the fingers or squeezing. They should be treated with absorbents. Hæmatoma, clotted, is recognized by the same history as liquid hæmatoma, by the fact that very little liquid pours through the syringe and the tumor does not diminish in bulk. It should be incised away from the line of important structures (vessels and nerves), properly injected, packed or drained. Lymphoma, strumous, recent, is recognized by its presence in strumous children without any symptoms of tuberculosis anywhere. It should be treated here as anywhere else. Lymphoma of Hodgkin's is usually multiple; there exists also enlarged glands in the axillæ and groins; the spleen is enlarged, also some-

times the liver; the white blood-corpuscles are increased. It should be treated internally by arsenic, ergot, potassium iodide in high doses. Lymphoma, tuberculous, recent, is suspected from the general condition of the patient or from the presence of the bacillus in a central gland removed for that purpose; inoculation of animals will assist; tuberculin may also assist; it is treated on the same principles as incipient tuberculosis of the lungs. Lymphoma, syphilitic, recent, is revealed by the presence of syphilitic lesions in the neighborhood, which may account for the enlargement, or at a distance, or by a syphilitic history; the specific treatment is the best diagnostic means. Gumma, recent, presents the same remarks. Hæmatoma, solidified, resulting from the same cause as liquid or clotted hæmatoma, when in a dangerous region, should be incised away from the line of the larger vessels and nerves and the fibrinous clots removed; then properly packed and drained. Sarcoma, pulsating, is characterized by pulsation with expansion and attachment to the bones; when the needle is not thrust too deeply into the cavity it may become filled with serum only.

The following are the gaseous tumors which should be extirpated: Growing or troublesome pharyngocele, œsophagocele, laryngocele, tracheocele, pneumatocele. These should be extirpated, especially if they have lost their connection with the passages, as sometimes happens. Enterocele, gangrenous, should be extirpated, of course.

The following liquid tumors should be extirpated: Angioma, varix, lymphangioma, persistent aneurism, serous cysts, hydatid cysts, bursal cysts (hygroma), tendinous cysts, persistent circumscribed chronic abscess or tuberculous abscess.

The following are the solid tumors that should be extirpated: Warts, papilloma, xanthoma, mycosis fungoides, sebaceous cysts, solidified hæmatoma in non-dangerous regions; lymphoma, simple (hypertrophy); Hodgkin's lymphoma when causing pressure symptoms; persistent strumous lymphoma, persistent tuberculous lymphoma, persistent syphilitic lymphoma, persistent gumma, myxoma, lipoma, fibroma, myoma, neuroma, chondroma, osteoma, sarcoma, endothelioma, epithelioma, carcinoma, encephaloid, melanotic, and colloid; scirrhus.

Tumors special to regions or to organs are displacements (hernia) or cysts or calculi. Those that should not be extirpated are those

which can be returned and fixed or anchored, such as the floating kidney, liver, spleen, hernia of all kinds, ectopic testicle. Solid foreign bodies, calculi (salivary, biliary, urinary, etc.), are diagnosed by the needle and the probe or sound.

Those that should be removed through an incision are all calculi or foreign bodies: salivary calculi; enteroliths, biliary calculi, urinary calculi.

Circumscribed urinary infiltration is diagnosed by the needle; it should be incised and drained.

Those that should be extirpated when milder means have failed are meningocele, encephalocele, salivary cysts; their diagnostic signs are well known. Also pharyngocele, œsophagocele, laryngocele, tracheocele, when they grow or are troublesome; they should be removed, especially if they have lost their connection with the main channels; aberrant goitres should be removed if growing or causing serious pressure symptoms. Pneumatocele should be extirpated when it is increasing in size. Enterocele, gangrenous, should be extirpated; also epiplocele, large and irreducible.

In résumé: the tumors which should not be extirpated are: 1. Gaseous tumors: emphysema, circumscribed; pharyngocele, etc., small and causing no trouble; enterocele, reducible and not gangrenous. 2. Liquid tumors: hæmatoma, liquid; cysts, purulent or abscess, chronic; aneurism, recent. 3. Solid tumors: cellulitis, circumscribed, indurated, subchronic or chronic; comedo; hæmatoma, clotted; lymphoma, strumous, recent; lymphoma of Hodgkin's disease without pressure symptoms; lymphoma, tuberculous, recent; lymphoma, syphilitic, recent; gumma, recent; hæmatoma, solidified in dangerous regions; sarcoma and carcinoma of pons, pulsating. 4. Tumors special to regions or organs: herniæ, cysts, calculi.

A most important clinical distinction is in tumors which are developed above the fascia of the region and those which are developed under it. The superficial or superaponeurotic tumors to be extirpated are diagnosed by the fact that the fingers can grasp them or meet behind and under the tumor. When large, the two hands must be used to grasp the tumor. When very large the fingers of one hand are placed on one side and those of the other on the other side, and efforts are made to make them meet under the tumor; during that time an assistant supports the body of the tumor. There is absence of pressure symptoms in superficial tumors.

Deep or subaponeurotic tumors to be extirpated are those which the above manœuvers show to have deep connections. When very thick it is likely that the tumor has also grown towards the deep parts, and must be studied as a deep tumor. Deep or subaponeurotic tumors are more interesting because of the greater danger in their complete removal. They are recognized by the fact of their incorporation with the structures; when large, they become superficial, and may come close to the skin or become attached to it. The following are the features to be determined in each case of deep tumor to be extirpated: First, is the skin movable or adherent? Second, are the margins circumscribed or limited or diffused? Third, what is the mobility on the deep parts? If it is movable over the bones, is it clear or loose of important soft structures; if adherent, are the adhesions loose or are they dense and broad or limited? If it is attached to the bone is it in a mass or by branching fibrovascular processes or by a pedicle, and is it clear of important structures? If it is adherent, are the adhesions loose or dense, or broad or limited?

The condition of the skin is important to determine; when distended by a large tumor, a portion of it must be extirpated along with the tumor, to prevent redundancy of the flaps; when the skin is adherent it should also be removed. The margins must be next delineated; when circumscribed or limited, it is a favorable sign, because the tumor will be easier to remove along a well-determined line of dissection with safety and in its entirety, that far at least; when the margin is diffused it is a most unfavorable feature, because of the uncertainty of the line of dissection and the absence of all assurance of removing all the diseased parts. By freezing sections of tumors on the spot and examining them there also under the microscope is the only positive assurance. The non-adhesion or the adhesion of the tumor to the bones is important to determine; when the tumor is movable, it must be determined whether it is clear of the important structures,—i.e., of the vessels, nerves, and special organs.

When it is clear of the important structures, the extirpation will be easier and safer. When it is over or near these structures, it is often impossible to determine the degree and nature of the adhesions until the operation has reached that stage. When the adhesions are loose and are easily torn, all is well. When they are resistant, then there is constant danger of cutting or tearing away some of the structures, with all the possible risks and dangers. When those

adhesions are also extensive the case may be hopeless. If the operator then desists, he will have performed an exploratory operation. Double ligatures and double hæmostatic forceps must be freely used, never cutting except between the two. It is prudent also in those cases to endeavor to locate the large vessels and to pass a provisional ligature under them before dissecting too close to the dangerous points. This provisional ligature is removed after all the bleeding has been controlled, or it may be decided to convert it into a permanent one.

When the tumor is adherent to the bone, if it is clear of important structures, again all is well, as it may be gouged out with little risk. When it is over or near important structures the risk is greater. When the attachment is extensive the risk is much greater, and complete extirpation may be beyond our means. When the tumor is encapsulated, the capsule should be removed, because it is often infiltrated microscopically.

It is always of the utmost importance to explore the regions of the lymphatic glands which receive the vessels from the affected regions. When the glands are only inflamed sympathetically they might be left alone. If there is any doubt, they should be removed at once. When the glands are enlarged in suspected malignant diseases, they should be removed; to leave them behind is a grave surgical mistake, since the disease will be reproduced and another operation will have to be performed, whereas it should have been done with the first.

When the tumor has been removed we may form an idea of its true nature by the appearance of the surface of the exterior, or, better, from the appearance of the surface of the section coupled with the condition of the lymphatic glands and the clinical history.

The microscopic examination is the most reliable test. Yet in some cases the clinical features must be taken into great account. Microscopic examination alone must not and cannot overthrow clinical symptoms and history, including regional symptoms and general condition. Finally, it may be necessary to inoculate one of the lower animals to decide, for instance, to make sure of tuberculosis; or to differentiate between small round-celled sarcoma against some granulomata that may resemble them, such as gumma, granulation tissue, and inflammatory swelling.

It is only after all this that a rational diagnosis and prognosis can

be established. It will save a surgeon the mortification of diagnosing one kind of tumor when subsequent events prove it was another.

Tumors may cause other diseases. All tumors, even benign tumors, when growing, may cause pressure symptoms. When these affect important structures they may force operations which the tumor itself from its nature or its size would contraindicate. Malignant tumors, by spreading to the neighboring lymphatic glands or to the internal organs, may cause trouble far more serious than the original tumor itself.

Tumors are themselves liable to diseases like normal structures. They may be the site of injuries (contusions, wounds, ruptures, etc.); of malformations,—i.e., deviations from the normal type, or congenital malformations of the region wherein the tumor is developed; of neurosis (pain in the tumor); of softenings; of sclerosis or hardening; of congestion, inflammation, abscess, gangrene, ulceration, fistulæ; hemorrhages, internal and external; degenerations; recurrences on the spot or in the neighborhood, or in the internal organs; they may cause anæmic cachexia from the pure exhaustion of the subject or from the generalization in the body. These diseases of tumors may force one to operate sooner than would be done otherwise, the operation being either palliative or curative according to the circumstances of the case.

Inoperable tumors may be inoperable because of the feeble condition of the patient from whatever cause, enormous extent or size, entailing probable fatal loss of blood due to the general oozing from such a large surface or from large blood-vessels, or because the margins of the tumor are so diffused that it is impossible to tell where they begin and where they end, or because the adhesions are found to be too extensive or too dangerous; or because of repeated recurrences on the spot or on the glands or the important organs surrounding them, or because of the spreading to the internal organs, lungs, liver, kidneys, etc.

Multiple tumors should not be operated upon except when very few and of slow growth. Tumors with cachectic symptoms from excessive debility alone or from malignant cachexia should not be operated except for palliative purposes, when the patient can stand the ordeal.

Palliative operations or partial removal is justified when the pressure symptoms cause unbearable pain. Also when an ulcerated

surface is emitting an offensive smell unbearable to the patient and to the attendants; then, curetting of the surface is called for. It must always be well understood by the patient and his relatives that these operations are at best but of transitory benefit; do not let them think that there is anything more in them. Sometimes these operations are followed by a more rapid course of the tumor.

Before closing I must impress upon your minds the importance of the following points, among others: Cocaine in some cases may answer as well as ether or chloroform. To operate early is the secret of permanent cures. Remove all the tumor and glands in one single mass if possible. If the glands are remote, it is safer to remove them also, whether diseased or not. In dangerous regions, except the limbs, place loop ligatures or ligate the large arteries and veins as soon as the borders of the tumors are cleared and the under surface is reached. Remember in operating that sarcoma usually follows connective tissue, blood-vessels, nerves, sheaths, muscles, and that carcinoma oftenest follows connective tissue in spreading. After the operation do everything to secure primary union; stitch up divided muscles, tendons, fasciæ, nerves; suture the deep planes of tissues with absorbable threads. If the edges do not come together, use grafts, Wolfe's or Thiersch's. Finally, if the tumor returns, in the cicatrix or in the glands, remove it at once; lose no time. It is sometimes necessary to operate several times to effect a permanent cure or to prolong a life that may be particularly precious to loving and dependent ones.

A CASE OF HÆMATOMA, WITH REMARKS ON OTHER COMPLICATIONS.

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GENTLEMEN,—H. A., colored, aged thirty, married, with children, presented himself before you at the clinic hour April 14, 1897. He was sent to me from Lumpkin, Georgia, by Dr. J. W. Patterson.

The man gives, you perceive, a rather unsatisfactory history. He has no traces of syphilis or tuberculosis, and to all appearances was a healthy man up to a year ago, when he was ploughing and "wrenched his back and felt something give way." The loins and back gave him a considerable amount of pain soon after this injury, and later there appeared upon the right side, near the first lumbar vertebra, we presume, a small lump, which he tells you was no larger than one of these rolls of cotton bandage.

We will now examine him, and the protuberance upon his back will be the first thing to arrest your attention; and it is for this that he seeks surgical relief. It is no easy matter, gentlemen, to form a positive diagnosis upon any enlargement of this size upon mere inspection. You will, therefore, resort to percussion, auscultation, and palpation. Percussion shows dulness; auscultation reveals sound in the mass; palpation gives distinct fluctuation. His temperature seems normal. We will now examine his pulse. We find the impulse weaker and slightly impaired in the right radial pulse, while the left radial pulse is strong and not more than 80. His respiration is normal, but the heart-beat is intermittent, and the impulse of its beat may be felt on the left and right sides by the finger-tips applied near the axillary line.

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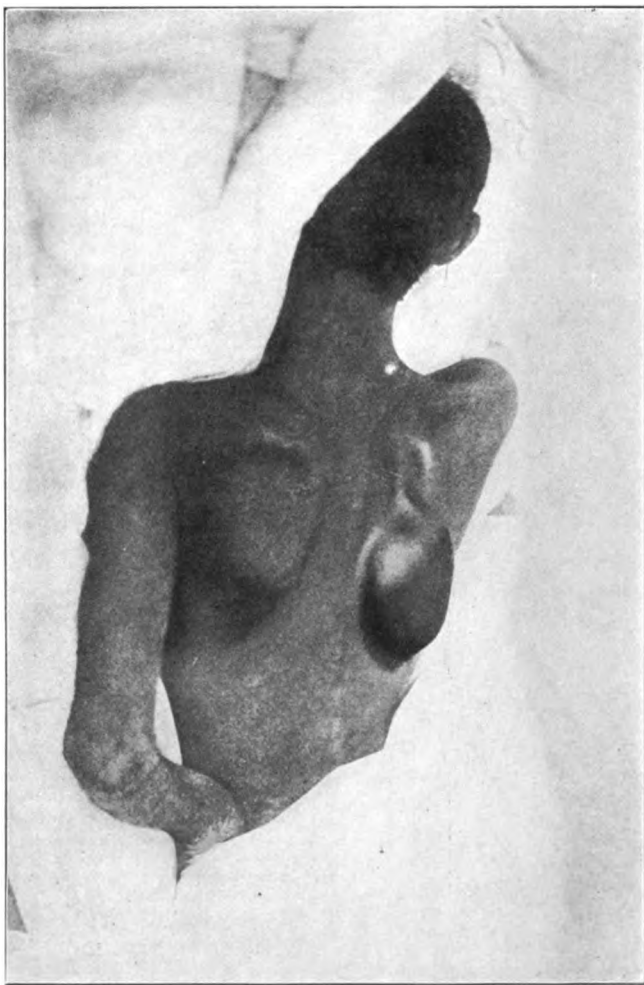
Hæmatoma near first lumbar vertebra following strain.

We will have to be careful to avoid a serious mistake in diagnosis. We will therefore introduce a hypodermic needle into the mass, remove some of the fluid, have it examined microscopically, and report to you later. While we are awaiting the report, it is well to recognize in the fluid which has been taken out for examination the indications of a dark-red grumous fluid which several around have said was blood. The absence of any caseous material so far could be accounted for on the basis of so small a needle, while thick pus could not pass through the canal of the needle. Then there seems to be a sediment of more consistence and of lighter hue, when the fluid was poured from one part of the pan to the other. A hurried microscopic examination of the fluid has been made by a very able bacteriologist, not connected with the Southern Medical College, and he reports pus. I am not disposed to follow my first impulse, which was to open this fluctuating mass and remove the fluid, of whatever nature it may be. Hence we will keep some of the fluid for the examination of Dr. F. S. Bourns, Professor of Bacteriology, and will await his report until Friday.

Friday, April 16.—You have doubtless been very much interested to know the result of the microscopic examination. It is that the fluid is nothing more than disintegrating blood.

As we may be confronted with a bleeding vessel of some magnitude, or as we may possibly have to deal with an aneurism, I deem it wise to remove the blood by means of a canula with trocar. You will notice that nearly a pint of red grumous fluid is in the graduate. We are now able to feel two masses, one in the upper and one in the lower portion of the enlargement. The ribs may also be felt, now that the fluid has been removed, and they are evidently bowed and pushed upward. We will now place adhesive strips over the punctures and cover the whole with iodoform, iodoform gauze, and compress by cotton under a stout roller bandage surrounding this portion of his chest and his abdomen down to his hips.

We will again await the revelations of the microscope.

Wednesday, April 21.—Upon seeing this mass again, you would scarcely believe that a pint of fluid had been removed from it. It is tense and fully as large as an ordinary quart bottle. The pulsation and fluctuation still exist. The heart-beat is more regular, due probably to the equalization of circulation obtained by thorough catharsis by calomel and soda.

The general consistence of the whole enlargement is far from solid, and yet elastic and nodular.

Operation, April 29.—He is willing for any operative procedure that may be deemed advisable.

After a thorough examination by Drs. J. G. Earnest, W. P. Nicolson, W. S. Elkin, J. C. Olmsted, and F. W. McRae, with the constant attention which has been given to the man's condition by Dr. J. McF. Gaston, Jr., and myself, we all feel warranted in opening up the mass and packing the cavity with iodoform gauze, but we will first remove the fluid as before by a trocar and canula. There is fully a quart of fluid in these two receptacles. The appearance of the fluid is the same as before, and Dr. F. S. Bourns has found no pus cells nor bacteria, but disintegrating blood with white blood-corpuscles, not, however, in excess of the usual ratio.

It is evidently a hæmatoma of some kind, and is rapidly infiltrating the tissues of his back, so that at one point a soft and boggy feel meets all the indications of an abscess; but we know that it can be nothing more than the blood which has come near the surface.

You observe that I am prepared for anything which may be encountered, having an aneurism needle armed with silk, catgut to ligate small vessels, styptics to arrest oozing, for which I rely chiefly upon pure carbolic acid, bone-forceps to resect ribs if the intercostal arteries should be the source of hemorrhage, or if it should be found that the long thoracic is involved. The decision between extravasation from an original laceration of an artery or a dissecting aneurism can only be made after thorough exploration of the cavity.

He will be put under the A. C. E. mixture, and the incision will be made on the right margin of the spinal column in the most protuberant and the least resistant portion of the enlargement. As you see, the flow of blood is not in a jet or even in any great or alarming quantity, such as we would have in the immediate sac of an aneurism. We will prudently replace the knife, however, by the scissors in the further part of the operation, with more security.

The upper part of this cavity contains well-formed blood-clots, which will not be disturbed. The lower part contains more solid masses, and, as a suspicion of malignancy has been expressed by some of these gentlemen, we will have these small pieces I am cutting sectioned and hardened, and, in the course of four or five days, examined under the microscope. The whole incision must be eight

inches in length, and therefore the upper part may be sutured with silk.

The whole cavity has been very securely packed, using four yards of iodoform gauze, in four separate pieces, while the wound above is comparatively closely approximated, increasing the compression made by the gauze and thus being very apt to arrest the hemorrhage. The man may be given one-thirtieth grain of nitrate of strychnine, and, when the wound has been thoroughly cleansed with carbolized solution, it may be dressed antiseptically.

The iodoform gauze serves as a drainage-tube by capillary attraction, and will remove all fluid. The cotton over the external pad of iodoform gauze will absorb any of this and prevent reabsorption, so that he need not be dressed till Saturday, three days from now.

Wednesday, May 5, 1897.—You will observe that the dressings have been replaced on Saturday as directed, and now the man is doing very well.

Dr. Bourns has reported simply organized blood-clot, and no cells such as we often find in malignant tumors.

Dr. F. W. McRae, whose clinic hour this is, has examined the man, and thinks he will get well, despite his idea of malignancy, while Dr. Bourns also gives a favorable prognosis.

We will remove the stitches, and we find that the upper part of the wound has united. His temperature has been as high as 101° F., but is now normal, while his pulse is 80. His urine presents no unusual features, except excess of phosphates and increase in urea. The specific gravity is 1016, reaction acid, color dark yellow.

The wound was thoroughly drained by the gauze, and probably a pint or more of blood was on the first dressings removed last Saturday. He is now more cheerful, is eating better, and sleeps well. The wound is comparatively free from hemorrhage, but he is not entirely free from danger from hemorrhage, and is kept perfectly quiet in bed.

The masses above are sloughing and pus shows upon the gauze, and can be smelt very distinctly.

The result of this operation seems better than we expected.

Wednesday, May 12.—He is now quite weak and somewhat disheartened at the sight of the copious discharge from his wound, but he will be put upon pepto-mangan-Gude, which may be given in tablespoonful doses three times a day. He is to be given calomel and

soda before beginning this, so that his bowels may be kept in a healthy condition.

The dressings are necessary every other day, in order that the external surface of the wound may be kept in an aseptic condition. No contamination of his system has followed the continuous use of iodoform and iodoform gauze, but smaller quantities have been used now that the cavity is gradually diminishing. He is anxious to go home, but his wound will not justify any exertion for the present.

As you are aware, gentlemen, the circulation is much more rapid in active exercise than it is in passive rest. This is exemplified by the red and heated appearance of the face and the more rapid pulse and respiration which are noted in a person who has been running. In the same way the blood may remain somewhat in abeyance in a hæmatoma of this kind, if the patient is quiet, but may be ungovernable if exercise be too great.

There is no necessity for his lifting weights or of bending over too much for some time. The pulsation may still be felt, but is not so marked as before.

In regard to his diet, he may eat meat and bread, vegetables, and almost any form of his accustomed bill of fare.

The wound will be again examined thoroughly here, on the college grounds where he is boarding, on next clinic hour.

Clinic, May 17.—There is now an opportunity for Dr. Bourns to examine this wound, and he is surprised to note the rapid disappearance of all the masses except those in the bottom of the wound. The discharge is not so great.

Clinic, May 20.—The patient will be allowed to go home to-day, as he is able to walk and the discharge is so much changed, the character being no longer sanguineous or even purulent, but serous.

The upper part of the wound has healed so completely that the ribs may be felt in their normal relations and the coarctation is disappearing from the chest wall. The lower part of the wound is open, having a space of three or four inches of granulating surface on each side of the opening into a cavity which might still admit a man's first three fingers, and yet which causes no inconvenience or pain while it is being packed with gauze.

Gentlemen, so great a man as Sir James Paget once made a diagnosis of aneurism, and cut into the mass, intending to ligate, but appearances were so deceptive that he decided that the original diag-

nosis was not correct, but that the tumor was malignant. He did not complete his operation. The patient died of hemorrhage, and it was found that it was a case of aneurism. If a post mortem is ever made of this man, it may reveal a similar surprise. My opinion is that, in the injury received more than a year ago, some smaller artery was ruptured, and that, with the compression brought to bear upon the wall of the cavity, the opening was closed and a thrombus formed which arrested hemorrhage. This would not have resulted in the case of a partial rupture of an aneurismal sac having occurred, but must have necessitated other measures to control the hemorrhage. Usually it has been found requisite to ligate the vessel which has been divided in a hæmatoma, and I have had good results in a number of cases of this kind, in the subclavian, femoral, popliteal, and anterior tibial arteries. This will be the first occasion in which compression has succeeded, if it turns out to be finally successful. The final restoration of the circulation by anastomosis would be expected to obliterate all traces of the original injury. Yet the theory of malignancy may be left out of the case entirely, with the favorable progress of this case in three weeks from the operation, which was performed April 28.

NOTE.—On May 22, Dr. J. W. Patterson wrote that he had dressed the wound after having washed it out with carbolic acid solution. He had found the wound packed with iodoform gauze, and packed it again. We had never washed it except externally with a solution of carbolic acid, because it seemed clean, as Dr. Patterson had stated that it was, and that there was no odor about it at all when he dressed it. He further stated that "it doesn't seem to be healing from the inside at all."

On June 4, Dr. Patterson wrote that he had died on the 3d of June. He had been expected to die for a week. The wound had been discharging copiously, but no blood. The patient fainted while the wound was being dressed and washed with carbolic acid solution. He was given one-thirtieth grain of strychnine nitrate, and revived. He became more and more œdematous in the face and limbs. He died soon after the last dressing.

THE THERAPY OF SUPPURATIVE KIDNEY.

BY THOMAS H. MANLEY, M.D.,

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GENTLEMEN,—The current treatment of localized suppurative
lesions of the kidney belongs to one of the latest chapters of opera-
tive medicine.

It may be said that, practically, nearly all the more exact and
effective measures devised for the recognition and treatment of
lesions along the course of the urinary tract, in male and female,
were quite unknown to the profession as late as twenty-five years
ago, and those which essayed direct intervention in diseases of the
renal parenchyma, or renal ectopia, date back but little more than
fifteen years.

Experimental research, inventive genius, a better practical
knowledge of the structural elements of the renal organs, the limit
of tolerance, and their regenerative properties, together with anæs-
thetics and asepsis, have laid the foundation of a rational and salu-
tary therapy in this class of lesions.   Though, while conceding this,
it should also be remembered that such progress never could have
been made without the safe guide of accuracy and precision in diag-
nosis, now rendered possible by the great advances in the physical
sciences, in bacteriology, in mechanics, in optics, and in chemistry.

The direction of progress here has been from below upward, from
structure to organ, and from the coarser anatomic constituents to the
finer histological elements, on again to the bacterium and its mani-
fold genera.

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The first far step forward was when the great expansile properties of the urethra were determined; the next, when it was shown that the urethra possessed the property of marked longitudinal tension in the excision of stricture. Another great advance was made when it was found that by the employment of silver suture vesico-vaginal and recto-vaginal fistulæ might be permanently closed. Abdominal or vaginal cystostomy, when feasible, for prostatic, malignant, or other stenotic conditions of the urinary passage, has proved a great relief measure, another example of the application of aggressive surgery to the bladder.

Vesical and renal surgery had reached the summit of operative achievement, so far as we know, for all time, until a very recent period. To have attempted an exploration beyond it, into the deeply embedded ureter or the kidney, without the aids of anæsthesia or asepsis, would have been quite impracticable and attended with grave dangers. Before the time of Lord Lister we have no records of successful plastic surgery of the ureter, of nephrorrhaphy or nephrectomy for diseased conditions of the kidney.

The surgery of the ureter and the kidney is, par excellence, a new creation, at present little more than past its first crude stages of development. On account of the great depth of the kidney, its position behind the peritoneum, its high vascularity, and its relations to important organs, surgeons hesitated a long time before advancing on it through a free excision in the soft parts.

CLINICAL PHENOMENA IN THEIR RELATION TO OPERATIVE INTERFERENCE.

The various steps in the operative technique for renal lesions are now established on fairly definite lines; but there is a great diversity of conditions, wherein it is imperative that our mode of procedure must be guided rather by the results of clinical experience than by what may seem the most practical from the stand-point of surgical interference. In no pathologic condition is this more accentuated than in the various types of suppurative inflammation involving the kidney, which alone will be briefly considered here. In these days of the *furor operatoire* it may be well, while on this topic, to take a retrospective view of the field and see if, since the apparent seductive security which antisepsis or asepsis offers, the dangers to life from suppurative kidney have not been greatly over-estimated, and

whether or not a considerable proportion of those cases now designated "surgical kidney" do not legitimately come under the domain of internal medicine.

ANATOMIC CONSIDERATIONS.

Before one can have a proper understanding of the principles of the therapy of renal suppuration, a familiarity with some of its causes is important. In a considerable number we will find these are primarily anatomic. If we regard the urinary apparatus in outline from its structural composition, we will find that it consists of Malpighian tufts and secreting epithelia which absorb all the uropoietic elements from the blood, then discharge them, first, into the convoluted tubules, to the spiral, looped, and, finally, into the straight collecting tubules. These in turn are aggregated in groups, open into the calyces of the kidney at the papillæ, which by their junction contribute to form the pelvic apertures.

From this point the passages begin to widen, the ureters being capable of sufficient expansion to receive and project into the bladder, practically, any calculus which may find lodgement in the renal pelvis.

It must be apparent that the capacity and contractile energy of the ureter is most extraordinary when it is remembered that calculous impaction of it, except in diseased conditions of its mucous membrane, is exceedingly rare, and concretions are most commonly found either in the cortical or medullary substance of the kidney, or else deposited in the bladder.

Having cleared the ureter, the next segment of the urinary tract which offers the greatest resistance to concretions, and which of itself is often the seat of stenosed conditions, is the male urethra. Therefore, for the full functional activity of the renal organs, a free, unobstructed outlet to the urine must be provided in the canals, the pelvic and cystic pouches, the canaliculi, and the primitive tubules.

In unilateral, local, inflammatory, degenerative conditions of the kidney, clinical evidence, as well as the ultimate morbid anatomy, conclusively points to mechanical obstruction as the initial step in the evolution of local suppurative changes.

The mucous elements of the urethra are continuous with those of the kidney, although a very wide anatomic and morphologic distinction is shown in the various areas of the urinary tract.

Regurgitation or a back flow of urine towards the kidney is prevented by two unyielding sphincters,—one set at the apertures into the bladder and the other at the pelvic outlets into the ureters.

In the male, notwithstanding the diverse source of the vascular and nerve-supply to the urinary and generative organs, a close sympathy exists between them, and in infectious maladies of the one the other is not uncommonly involved. This is not so obvious in the female, although in both sexes we seldom find complete immunity of one set of these organs when the other has suffered extensive damage consequent on a mechanical obstruction or an infective lesion.

GENERAL OBSERVATIONS ON TREATMENT BY TENTATIVE AND RADICAL MEASURES.

The recognition and direct treatment of local suppurative lesions of the kidney provide us with one of the latest and most important advances in modern medicine.

Until recently the student knew of little or nothing but "Bright's disease" of the kidney, and few if any had yet ventured to treat any renal lesion by other than tentative means. But when the dazzling light of recent discoveries dawned on us, in our enthusiasm to press forward some have, no doubt, gone too far, or have been too precipitate in resorting to sanguinary measures to the neglect of internal medicine, hygiene, and other conservative measures. My aim in the present instance will be to indicate as briefly as possible some of the principles which should guide us in the management of recognizable renal suppuration,—that involving the pelvis or parenchyma.

1. Prophylaxis.
2. Internal or medical treatment.
3. Surgical treatment.

Of late years a vicious and highly reprehensible practice has gained a dangerous foot-hold among a large number in the profession, when they encounter neoplastic proliferations, tumors, ulcers, etc. We are largely—in fact, too far or too generally—guided in our line of action by the histological findings of the microscopist. If, for instance, a microscopic section reveals proliferative epithelial changes, the case is at once stamped as some type of cancer; or, if embryonic elements are discovered, it is pronounced sarcoma, in

which event, perchance, the unlucky patient is consigned to prompt surgical treatment, under the assumption that the malady is malignant, for which one must "cut early and cut wide."

And so it has been, in a large measure, with the renal secretions. Only allow the urinary sediment to reveal the presence of pus, intermingled with cylinders or the renal epithelia, when at once, without much more deliberation, the case is set down as "surgical kidney," which term, literally interpreted, heretofore implied the necessity of surgical or sanguinary intervention. Time has, however, demonstrated that many types of suppurative kidney in the youth and the adult may undergo spontaneous cure, are amenable to constitutional remedies, or may continue without any serious embarrassment of the general health. But this conceded, the fact remains that the number of cases of renal abscess or purulent accumulation requiring surgical relief is sufficiently large to justify a careful study and demand surgical relief. We may, perhaps, concur in this matter, with the view lately expressed by Dr. J. William White, who says that, "despite the number of operations on the kidneys within the past fifteen years, there is still manifest an undue conservatism in dealing with renal conditions," etc. (*Annals of Surgery*, January, 1897.)

SURGICAL THERAPY AND NECESSARY PRELIMINARIES.

It has been said that an amputation is an opprobrium of surgery; and, broadly speaking, one might add that all surgical operations are equally an opprobrium of the healing art. This is an axiom and a truth which cannot be too strongly expressed. For example, to incise or resect a kidney is in no sense a cure if we fail to unite with sanguineous measures those remedies which possess restorative or reconstructive properties. It necessarily, therefore, follows that surgical intervention is not under any circumstances to be entertained until we are assured that all the resources of internal medicine are first tested. This is all the more important to bear in mind when we recall the enormous mortality which attends many of the major renal operations. Thus, Newman sets the average mortality of nephrectomy at about forty per cent., and Gross placed mortality after nephrotomy at about twenty-three per cent. These statistics are from recorded cases, and every one knows how general the custom is, with some, to never publish their fatal cases.

Brodeur places the mortality as very high for all operations on

suppurative lesions of the kidney, and this accords with Guyon's experience.

We have every type and variety of suppurative kidney, depending on widely different causes and revealed by a most complex symptomatology. These must be well comprehended before intelligent therapy is instituted. The diagnosis of suppurative renal lesions has been greatly perfected of late years, so that quite precise knowledge in this direction is now possible.

In 1883, Marcus Beck, of London, in writing of renal suppuration, used the following terms in speaking of the futility of attempting diagnosis: "There are, in fact, no definite symptoms, either subjective or objective, accompanying this form of renal disease." (*Surgical kidney*, "Dictionary of Medicine," Quain, seventh edition, p. 1573.)

This sounds strangely in our time, when probably suppuration of no organ in the body is more readily detected than that from a diseased kidney. There are many difficulties in the way, however, in both sexes, which require special knowledge to overcome. One should not only have acquainted himself with the art of physical examination of the renal areas, but, of all things, be thoroughly conversant with the constituents of the urinary sediment, the normal salts, the source and character of the epithelial, degenerative, and purulent elements. These things accomplished, the way is clear for treatment.

The vast importance of urinalysis and morphological examination of the urine has often been well illustrated to me in pyonephrosis, but never more emphatically than in the case of a woman who came under my care last winter. Among other things, she suffered from the most agonizing distress in micturition, some uterine prolapse, leucorrhœa, and pain in the back and side (right). Her case had been diagnosed and treated as cystitis. It was thought by another that the fulness in her groin was caused by an appendicular abscess, and again, that she had a pyosalpinx. After the third examination of her urine it was clear to me that the case was one of purulent kidney. On operation for nephrectomy the remains of the kidney were removed, the capsule containing nearly a pint of grumous pus.

An accurate diagnosis of the type of renal suppuration is more than two-thirds of the battle; to consider treatment without empha-

sizing this would be little more than waste of time. For by this we decide not only our line of action, but more, whether, indeed, any description of radical treatment is admissible or necessary at all.

Holt and other distinguished pediatrists claim that renal suppuration is by no means uncommon in young children; usually running a mild course and commonly undergoing spontaneous recovery. In a tuberculous individual with persistent renal pyuria, but with a free, painless, unimpeded discharge of urine, who would think of anything further than constitutional measures?

Removal of the causes—prophylaxis—is the key to the successful treatment of the greater part of the most aggravated and dangerous varieties of pyelonephrosis. Czerny, Habershon, Weir, Tuffier, and several other noted writers have observed that the most common causes of pyonephrosis were from urinary stasis, from impediment to the passage of the urine, later ammoniac decomposition and infection; this primarily succeeding from stricture; or stenosis from enlarged prostate, contracture of the ureter, or, finally, calculous impaction from lithiasis, leading to concretions in any of the tubular structures in the kidney or the evacuant channels.

In order, then, to obviate urinary stasis, urethral strictures should be treated, and turgescence or interstitial hypertrophy of the prostate dealt with, by suitable methods.

Genuine stricture of the ureter is exceedingly rare, except when the tube is encroached on by displaced organs or growths. Urethral stricture and prostatic hypertrophy offer impediment from below the bladder. Calculous impaction most commonly takes place in the renal pelvis, though it may rarely involve the ureter. Cystic calculus may induce vesical or urethral obstruction. Mischief succeeds permanent impaction through the consequences which depend on urinary stasis, as ammoniacal decomposition of the urine, infection, and resorption. Putrescent urine may be sent down from a suppurating kidney directly into the bladder, though, if the mucous membrane be healthy and the passages are clear, this organ may escape septic inflammation. In the majority of cases of non-tubercular obstructive pyelonephrosis the indications for treatment are clear enough.

LOCAL EXTERNAL MEASURES.

1. Stricture must be treated and the urethra cleared.

2. If calculus concretions offer impediment or provoke persistent irritation, they should be removed.

3. Vesical and urethral irrigation may be necessary for a time to clear away purulent collections and re-establish healthy action of the mucous membrane.

4. In old men methodic aseptic catheterization should be insisted on if a tendency to urethral obstruction exists.

INTERNAL TREATMENT.

The Pharmacopœia provides a wealth of medicinal remedies which act with special energy on the kidneys and urinary tract, which, no doubt, if more critically studied and judiciously administered at the proper time, would often obviate the necessity of sanguineous procedures.

The history, habits, and occupation of the patient must be considered. Is he gouty, rheumatic, syphilitic, or tuberculous? Has he oxaluria, a uric acid or a calculous diathesis? Above all, can he secure wholesome drinking water, that free from an excess of the lime salts? Calcic saturation of water is one of the most prolific causes of renal or vesical concretions. Here in New York our pure water-supply provides us with practical immunity against calculous disease, as it is an extremely rare disease with us.

The alkaline and many of the vegetable diuretics, with small doses of mercury, should be given, when we may observe, both by clinical evidence and by urinary analysis, what progress is being made. It goes without saying that general and special treatment must go hand in hand, that habits must be corrected and regimen so adjusted as to meet indications. Medicines are called for which are not only well-known solvents, but which also restore the healthy secretions.

ON THE SURGERY OF THE URETER AND KIDNEY IN SUPPU-RATIVE CONDITIONS.

It has been noted that diseased conditions of the lower urinary tract are often the starting-point of renal suppuration, but the converse is equally true, though not so generally,—viz., primary suppurative and other disordered or diseased conditions of the kidney itself may be the starting-point of the most agonizing and rebellious affections of the ureters and bladder. This is emphatically the case in the suppuration of renal calculus and renal tuberculosis, when, in other words, we have *descending* infection. In chronic, aggravated

cases the intense ammoniacal reaction of the urine provokes the most agonizing cystitis; it, in fact, quite destroys the mucous lining of the bladder, leads to hypertrophy, rigidity, contracture, and loss of function.

These are the cases *par excellence* which demand the radical but salutary interference of judicious surgery, for without it perish they must in all but exceptional instances, as when possibly an adherent kidney may discharge an abscess into the intestine or out through the abdominal walls. These are always grave cases, because they seldom submit to surgery till the constitution is shattered, and because, too, of the inherent dangers in all operations on diseased kidneys.

OPERATIVE MEASURES IN URETERAL STENOSIS, IMPACTION, OR SACCULATION.

In a certain proportion of cases of pyelonephrosis, as well as in hydronephrosis, there are varying degrees of ureteral obstruction, for which, of late, dilatation has been undertaken by way of the bladder. Simon, of Heidelberg, was among the first to recommend this, as a relief measure, but Czerny alleges that it is sometimes impracticable, always difficult, and sometimes dangerous. Brodeur claims that the exploration of a contracted ureter is by no means a simple procedure, even in the female. In six male cadavers he was unable to penetrate the ureter in all but one, and in this one the sound entered but three centimetres.

Skene denies any place for the internal catheter except as a diagnostic aid.

From the writings of Fenger, of Chicago, we learn that he has devised a very ingenious method for shortening and restoring to the normal position the ureter in those cases of lateral sacculation or such sharp flexure as may arrest the urinary stream into the bladder. (*Journal of the American Medical Association*, March 10, 1894.)

Küster has reported a case of rupture of the ureter and fistula in pyelonephrosis in which he resected the vent and successfully effected an end-to-end ureterostomy.

Cramer (*Centralblatt für Chirurgie*, No. 107, 1894) reported two more similar cases treated successfully by the same means.

In America very considerable original work has been done of late years in the surgery of the ureter by Reed, Myer, Valentine,

and many others. In the intracystic exploration they have been greatly aided by the modern improved cystoscope. The latest work in this direction has been done by Bazy, through the means of an operation which he designates "urétéro-pyélo-néostomie," for those cases of ureteral obstruction or resulting renal hypermegaly, in which stasis or stagnation follows from a torsion, flexion, or elongation of the ureter, with a tendency to sacculation or displacement. ("L'Uré-téro-Pyélo-Néostomie," *Revue de Chirurgie*, May 10, 1897, p. 401.)

NEPHROPUNCTURE, NEPHROTOMY, AND NEPHRECTOMY.

Renal surgery for chronic, suppurative conditions is always a procedure of considerable gravity. In many purulent conditions of the kidney, other than those attended with ureteral impediment, it may be required.

When the number of purulent *foyées* is considerable and their capacity is large, when their contents consist of inspissated pus, with calcic deposits and degenerate tissue elements, the ureters are not only incapable of draining off the accumulated material from above, but this befouled putrescent substance, by its irritating qualities in certain cases, provokes a most distressing cystitis.

Under these circumstances, when we have evidence of parenchy-matous infiltration or numerous dépôts of pus, with enlargement and displacement of the kidney, the necessity of considering surgical measures is forced on us.

There is probably no surgical condition which demands more cautious and deliberative consideration than suppurative kidney. But having decided interference imperative, what are the principles which should guide us? The cardinal objects in view are (1) to clear away all infected purulent elements, and (2) to prevent its re-accumulation. But in the contemplation of this we are met by two very formidable difficulties when a nephrectomy is intended. First, the condition of the opposite kidney, if, indeed, there be one; and, second, the large mortality,—very close to fifty per cent.

Nephrotomy, though always a grave procedure, has a much lower mortality, yet it can be regarded as little more than a tenta-tive procedure, and in its remote results are not always satisfactory. Effective drainage of a deeply lodged movable organ like the kidney is attended with difficulty, and, furthermore, in the feeble or cachec-tic, repair is imperfect and urinary fistulæ commonly follow. This is certain to occur when the ureter is narrowed or occluded.

According to Samby, Simon, in 1869, was the first to perform a nephrotomy for renal abscess. Mr. Henry Morris, eleven years later, first deliberately opened the organ to remove a stone by a nephrolithotomy. I am unable to discover who was the first in the field to do a complete nephrectomy for renal abscess. Renal puncture with the trocar and by aspiration has been successfully employed in two cases by Poussow for pyonephrosis. The difficulty comes, as in some cases of empyema, from the clogging of the needle by inspissated pus.

Nephrectomy is undoubtedly the ideal theoretic procedure, dealing with the kidney as we would with suppurating ovary or testicle; but even this, though apparently in special cases warranted, may be impracticable, as with a case reported by the late Greig Smith, in which the vena cava, the aorta, and the stomach were adherent to a suppurative kidney; and Howard Marsh has reported an instance in which the adhesions were so numerous and rigid that the kidney could not be safely dislodged. Eppstein has recorded several similar cases, collected from current literature.

No doubt the safer procedure will be a double operation *en deux temps*. First, a nephrotomy; then, provided but little of the renal substance is left and repair fails, a nephrectomy. S. W. Gross showed that nephrectomy for suppurating kidney had a mortality of fifty and eight-tenths per cent.; nephrotomy, twenty-three per cent. In twelve nephrectomies, consecutive to preliminary nephrotomy, but one died.

It should, then, be the established rule, in the surgical treatment of a purulent kidney which seriously deranges the general health, to *first* open into the parenchyma, and freely drain away all purulent collections, then at a later period, provided we have evidence of full functional integrity of the opposite kidney and a troublesome fistula follows, and the patient's general condition justifies it, remove what remains of the diseased organ.

SUPPURATIVE CATARRHAL NEPHRITIS AND PYONEPHROSIS WITHOUT PRONOUNCED LOCAL OR GENERAL SYMPTOMS.

We have abundant evidence, since the study of urinary morphology has been more generally pursued, that there are types of renal pyuria without any definite symptomatology, without any evidence of derangement of the full urinary functions or disturbance

of the general health. It is obvious that in this class of cases, beyond reasonable precautionary measures, no special treatment is called for.

Encysted abscess of the kidney has been discovered by various investigators, on autopsy, in patients who were never known to complain of renal symptoms.

TUBERCULOUS KIDNEY.

Since last autumn seven cases of renal tuberculosis have come under my notice. Five of them were consecutive to the pulmonary form. Four are now dead.

Recent researches have clearly demonstrated that tuberculosis is not an uncommon form of pathologic change in the kidney; and here we have good reasons to believe, as in the osseous or pulmonary structures, in cases of primary infection, it is often equally amenable to successful treatment. But we have as yet no specific for it; not even by Koch's modified tuberculin. Nevertheless, James T. Whittaker, of Cincinnati, regards it of value, while Virchow deprecates its employment, and says that its use should be prohibited, because it may arouse into activity the latent forces of the malady.

The suppuration of renal tuberculosis must be treated on the same general principles as are observed elsewhere. The presence of the bacilli stamp the character of the lesion, but nothing more, as it is now generally conceded that bacillary tuberculosis is in many cases a curable disease.

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Gynæcology and Obstetrics.

THE IMPORTANCE OF EXPLORING THE BIRTH CANAL IN SEARCH OF THE SEAT OF PUERPERAL INFECTION.

BY GEORGE M. BOYD, M.D.,

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GENTLEMEN,—In no branch of medical science have we greater problems to solve than those which fall to the lot of the obstetrician. Fortunate, indeed, is the woman who places herself in the care of one not only well trained in this special work, but who also has an appreciation of surgical cleanliness. Not the least important of these problems is the explanation of accelerated pulse and high temperature during the lying-in. These two valuable signs must be looked upon as indications of puerperal infection, and treated as such until some other explanation for their existence develops. Although the graver forms of puerperal infection are not often met with, particularly in hospital work, infection in its milder forms gives us many interesting cases to study.

Byers,[1] in "A Plea for the Early Recognition of Puerperal Infection," states: "Cases of puerperal infection seem to be more common now in private than in hospital practice. One explanation of this fact is, probably, because in maternities the most rigid antiseptic and aseptic practice is now in force, and also, I believe, because cases going wrong are recognized earlier and treated more promptly. There is also another cause too often met with in private practice, and that is the existence still of many nurses who do not know, who do not believe in, and who do not observe modern antiseptic precau-

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[1] John W. Byers, London Lancet, 1896, vol. ii. p. 525.

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tions. Cases of puerperal infection are, as we know, most fatal, but I am firmly impressed with the belief that if the conditions are recognized early and treated promptly many women might be rescued who are otherwise lost. In no condition is early treatment of greater importance than in puerperal infection."

Ground[1] states: "Infection is observed when the labor occurs in an infected or mephitic environment, when labor coincides with an infectious disease, or when the patient has old lesions in or near the genital tract. The mechanism of this kind of infection is explained. Air charged with noxious principles enters the genital tract. The infected blood of the patient may carry germs to the placental wound in the uterus. Phagocytosis is weak when the blood is already infected; hence the germs develop rapidly in the wound. The primary infection is thus stimulated: an old genital lesion, abscess, etc., may be awakened, or an old wound or lesion outside of the vulva may set up infection in the uterine wound, just as a blood lesion does when pre-existing."

Montgomery[2] states: "Clinically we find the disease varies in different patients. This is due to the varying immunity to micro-organisms. The varying power of resistance in different individuals produces varying types. These have been resolved into three: first, inflammation and local suppuration; second, inflammation and migratory suppuration; and third, hypertoxic infection without suppuration. The point of infection varies in labor and abortion, in the latter the placental site and erosions of the cervix generally being the avenues through which the infection has found entrance, while in the former entrance may be provided by lesions of the vulva, as lacerations of the fourchette, lateral wall, or anterior commissure, or lacerations of the vagina or cervix. The previous condition of the tubes may render puerperal infection certain, or displacement of the uterus presenting an obstruction to drainage may present a favorable soil for infection. The combat between the invading infection and the power of resistance in the patient may result in the limitation of the disease to local inflammation or suppuration occurring in abscess in the labium, cellular tissue of the pelvis, wall of the uterus, or in the Fallopian tube. Barriers of limitation are provided, immunity

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[1] W. E. Ground, Medical and Surgical Reporter, 1895, vol. lxxiii. p. 548.
[2] E. E. Montgomery, Journal of American Medical Association, 1896, vol. ii. pp. 231–233.

against further invasion is early secured. Second, the inflammatory processes result in migration of the inflammation; sometimes exclusively by way of the mucous lining of the tube to the peritoneum, which is rare, or it extends from without inward, or it may be mixed, involving the mucous membrane, the blood-vessels, and the lymphatics. Migration by the mucous membrane exclusively will produce salpingitis, while the mixed migration results in a multiplicity of lesions. In some cases the entrance of infection is so rapid and the power of resistance so slight that a toxæmia results, which produces a rapid fatal termination, with slight or no indications of the formation of pus. The fatal termination in puerperal infection may be occasioned by profound organic vices anterior to confinement, which render the power of resistance faulty. Second, by a regular progression of the lesion and invasion of its economy by the poison, continually augmented in quantity and toxicity. Here there is a struggle and the forces of nature are finally beaten down. Third, the virulent character of the toxic forces results in a paralysis of the nerve forces. Here the multiplicity of the micro-organisms is at the maximum, with minimum resistance." In seeking the explanation of high temperature and accelerated pulse, particularly during the first week of the puerperium, our investigation should commence with the history of the labor, and the character of the surroundings.

Were antiseptic precautions taken? Are we satisfied that the uterus was emptied? Were injuries noted of the cervix, vaginal wall, or perineum?

The first question answered in the affirmative, we turn to the second, which is of grave importance. In many of our cases, the seat of infection will be found in the cavity of the uterus. To satisfy ourselves that the uterus is free from any portion of the placenta or membranes, it is wise in many cases to make a manual exploration.

Grandin[1] reports cases showing the wisdom of following this course, and states: "The whole objection which may be offered is the fact that it is necessary to insert the hand into the parturient canal after the third stage of labor has been supposedly completed. How far this objection will hold in these days of rigid asepsis I am perfectly willing to leave to your judgment, but in mine the clean hand

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[1] E. H. Grandin, American Journal of Medical Sciences, 1895, New Series, No. 110, p 25.

inserted into the uterus, under conditions when access to its interior is unimpeded, causes no risk to the woman, certainly none comparable to those to which she may be subjected if the uterus has not been cleansed of all remnants." The third question is also of much importance. It demands a careful examination of the birth canal after the third stage of labor, with the purpose of ascertaining the seat and extent of injury. A plea might here be made for the more general use of anæsthesia at the completion of the second stage of labor, that our patient may be fully unconscious of this, in some cases, rather extensive examination. It has been the writer's custom for several years, in anticipating a cervical or perineal tear, to have the patient completely anæsthetized at this time, avoiding by this means a controversy with the patient later in regard to the wisdom of making an immediate repair. In a former paper,[1] with the purpose of examination and study of the parturient canal in search of the seat of septic infection, the writer divides the canal into three portions:

1. The uterine portion, most remote from external contamination.

2. The cervical portion, more liable to infection.

3. The vaginal portion directly exposed to all poisons or germs.

As septic infection is usually carried to the patient by imperfect adherence to antiseptic precautions on the part of physician or nurse, it would seem that the uterine portion of the canal, even with its many venous sinuses and highly constructed lymphatic system, would be least liable to primary inoculation. The non-puerperal uterus within the external os seldom contains the bacteria which are found in the cervical or vaginal portion. Then, too, this uterine portion is furthest from external contamination. If it is the usual seat of infection, is it not generally carried there from the cervical or vaginal portion? The cervical portion of the canal is not only nearer the introitus vaginæ, but encounters an additional danger because of traumatic injury. Lacerations of this portion give us numerous foci for inoculation by putrefactive or poisonous germs from without.

The vaginal portion is constantly in danger of infection, possessing many wounds all along its tract from perineum to external os. It would seem, then, that this portion was most frequently the seat

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[1] G. M. Boyd, American Gynæcological and Obstetrical Journal, December, 1894.

of direct inoculation, the cervical the less frequent, and the uterine the least.

In studying the puerperium in two thousand cases during the past seven years, the writer has been impressed with the freedom from symptoms which point to uterine infection. In this series of cases there were two septic deaths. The history and autopsy of these two cases are of interest.

SEPTICÆMIA; DEATH.

CASE No. 1215.[1]—A primipara, anæmic, aged nineteen years, was admitted to the hospital in labor May 13, 1895. The os was found to be well dilated, membranes not ruptured, the ovoid presenting by the cephalic extremity, normal position. Labor progressed normally, and in six hours after admission she gave birth to a female infant weighing seven and three-quarters pounds.

The placenta and membrane came away easily by expression. A median perineal laceration was noted which demanded a single suture. Twelve hours after delivery she had a chill, and her temperature rose to 102.4° F. The uterus was well involuted and there was no evidence of tenderness over the abdomen; the lochia was not offensive. The following morning the temperature remained high, with pulse accelerated, and the patient still did not complain of pain over the uterus. An examination of the birth canal showed the cavity of the uterus empty and apparently in a normal condition, but in the vagina and about the seat of perineal injury there existed grayish patches of ulceration of a pseudo-diphtheritic character. She was given an intra-uterine douche and the grayish patches were cauterized. The local treatment did not benefit her, and on the third day she was much worse, her temperature 103° F., and her pulse 116. Although no delirium existed, her condition was considered critical. Stimulants were used freely, but on the fifth day after delivery she died.

Autopsy made twenty hours after death. Rigor mortis marked; patient anæmic. Abdomen somewhat tympanitic. On opening the abdomen there was found no evidence of peritonitis; the uterus and adnexa were in a healthy condition; the muscular wall of uterus seemed normal and its cavity empty. Examination of vagina showed the grayish patches that had been already recognized.

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[1] Maternity Records of Philadelphia Lying-in Charity.

PYÆMIA; DEATH.

CASE No. 1667.[1]—A primipara, eighteen years of age, fell in labor November 29, 1896. She progressed satisfactorily, the ovoid presenting in a normal position. In eight hours a male infant was born weighing six and seven-eighths pounds. The placenta and membrane came away intact, and there was noted a bilateral laceration of the cervix and an injury of the perineum extending up the vagina. The injury to the perineum was immediately repaired, six sutures being inserted. The patient bled freely during this repair, the hemorrhage apparently coming from the cervical laceration, which was controlled by the use of the hot douche. Six hours after delivery the patient complained of severe pain in the left hip and in the course of the sciatic nerve; later as being in the rectum. One hour later there was again considerable bleeding from the cervix, while the uterus remained well contracted.

On the second day a tumor was felt to the left of the uterus. This mass, which was quite hard to the touch, filled up the pelvis. The patient's general condition was one of extreme weakness, apparently from loss of blood. Her temperature was elevated, and there were some signs of infection. During the first week she frequently passed blood-clots, and it was now found that the tumor had considerably softened. She continued to become more septic, and it was noticed that the lochia, which had previously been normal, now contained a considerable amount of pus. There was no tenderness over the uterus, but the tumor on the left side of the abdomen and apparently anterior to the peritoneal cavity was extending towards the umbilicus. Three weeks after her delivery an abscess opened at the umbilicus. Irrigation of this sinus revealed the fact that it communicated with the tumor to the left of the uterus and opened into the vagina. She became more and more exhausted from the free discharge of pus, and died June 6, 1897, thirty-seven days after delivery.

Autopsy made ten hours after death. Patient emaciated; rigor mortis slight. General offensive odor; no discoloration of the skin, but marks on abdomen and breasts of recent parturition. A sound introduced through the fistula at umbilicus penetrated downward on the left side to the depth of eight inches. It opened into the large

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[1] Maternity Records of Philadelphia Lying-in Charity.

abscess cavity behind the pubic symphysis and extended across and in front of the bladder. No communication could be found between the abscess and the peritoneal cavity. The vagina was dilated and covered with a dark slough. To the left of the cervix an abscess cavity was found, the floor of this abscess being formed by the bladder, which was deflected to the right side. On opening the peritoneal cavity, there was no marked evidence of acute invasion. The uterus was well involuted and its cavity empty. A second sinus and burrowing abscess was found below the peritoneum, extending along the crest of the ilium within the sheath of the psoas muscle beneath the diaphragm.

The history of these two cases, the writer believes, demonstrates the relation of injury during labor to the primary seat of infection. In the first case we had a streptococcus infection, the injuries of the perineum and vaginal vault making foci for the entrance of microorganisms through the lymphatic system to the general circulation. In the second case we had a laceration of the cervix on the left side extending to the vault of the vagina and opening up the broad ligament, from which injury extensive hemorrhage occurred, forming a pelvic hæmatoma. The breaking down and infection of this blood-clot formed a pelvic abscess which burrowed above the peritoneum to the umbilicus, and below the peritoneum to the diaphragm.

It is interesting to note that the uterus in neither of these cases could have been considered the primary seat of trouble.

It seems to me that when the usual precautions are taken (in these days of clean obstetrics), and still we have some elevation of temperature and other evidences of infection, trauma produced during labor has very much influenced the seat of inoculation. For the purpose of determining what relation existed between trauma and elevation of temperature during the puerperium, the writer submits to your consideration the result of a study of one thousand cases.[1] Each temperature chart was consulted and a record made of those cases in which a temperature ranging from 102° to 103° F. continued for two days or more during the first week of the puerperium; also, each case was reviewed for the purpose of ascertaining whether there existed lacerations or not. The report is as follows:

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[1] Maternity Records of Philadelphia Lying-in Charity.

Number of cases with laceration of perineum, vagina, or cervix . 195
Number of cases with no laceration of perineum, vagina, or cervix . 805
     Total 1000

Number of cases with high temperature and lacerations 84
Number of cases with high temperature and no lacerations 11
     Total 45

The total number of injuries noted is one hundred and ninety-five. This rather high rate is explained in that the majority of the patients were primiparæ, and that injuries are recorded, in some cases, of a slight nature demanding a single suture. It is interesting to notice in the table that in forty-five cases with high temperature an injury existed in thirty-four cases, about seventy-five per cent. of the number. From this report we possibly can form an idea of the relative association of injuries to elevation of temperature, and can be influenced somewhat in our examination for the probable seat of infection. To those who have greater opportunities for obstetric work this report possibly will be only in accord with what they have already observed, but to the general practitioner with his numerous other duties, the uterus is usually considered the seat of infectious trouble and made the place of attack by chemical disinfection and curettement.

Kime,[1] in reference to this subject, states: "Frequently we hear the physician say, 'I curetted, disinfected, and tamponed, yet the patient died,' and it might well be added, 'as a result of the treatment.' "

The following history of a case of puerperal pelvic abscess shows the importance of seeking the probable seat of infection.

An Italian, aged twenty-six years, was admitted to the Charity, March 20, 1894. Six weeks before admission she had been delivered by a midwife. The labor itself was not difficult, but soon she developed fever, and when a physician was called in at about the fourth week after her delivery she was very ill, unable to leave her bed, temperature ranging from 100° to 102° F. Her tongue was coated, no appetite, and she had the relaxed moist skin of septic infection. Upon examination, the labia of the right side was found somewhat

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[1] R. R. Kime, Journal of American Medical Association, 1896, vol. xxvii. pp. 234–286.

tumefied.   A mass filling the right side of the pelvis and pushing a
well-involuted uterus to the left was felt.

External in the right groin could be felt a tumor resembling
very much an ovarian enlargement.

When the writer saw her about six weeks after her delivery, with
the exception of the swelling of the right labia, which was absent,
she was much worse.   Pulse feeble, skin bathed in a profuse sweat,
and she had lost much in weight.

Was it a simple pelvic abscess, a pelvic abscess with puerperal
tubo-ovarian disease, or a localized puerperal pelvic peritonitis with
slight tubo-ovarian trouble?

On March 22, 1894, operation was performed.   It was deemed
wisest, although there was no fluctuation or pointing, to cut down
above and parallel to Poupart's ligament, that an extraperitoneal
pus accumulation might be relieved.   With a rather obscure diag-
nosis this course seemed wiser than immediately opening the general
peritoneal cavity for tubo-ovarian trouble.

An incision of about two inches was made; after opening the
aponeurotic sheath of abdominal muscles and severing the latter,
slight fluctuation was felt.

An abscess was incised with the escape of about two ounces of
pus.   The abscess cavity was washed out and an iodoform-gauze
drain introduced.   There immediately followed an amelioration of
symptoms, and in three weeks she left the hospital recovered.   Three
months after the operation I made an examination, and could find
no evidence of the original trouble.   From a thin and anæmic con-
dition she had grown stout.

This case seemed to me to be one of infection of the vaginal por-
tion of the parturient canal, and it is quite possible that throughout
our patient's long illness the uterus never became infected.

WHEN TO EXAMINE THE BIRTH CANAL.

While many surgeons look upon the pulse record as the best indi-
cator of the patient's condition, the majority of obstetricians hold the
temperature record of greater value.   Any elevation of temperature
early in the puerperium demands a careful exploration of the par-
turient canal, for it is by the early recognition of infection that we
are able to combat it.

HOW TO EXAMINE THE BIRTH CANAL.

The patient should be drawn to the edge of the bed, or, better, placed upon an improvised operating-table. In the dorsal decubitus, with her legs well flexed, a digital examination should first be made; then a careful inspection should begin of the perineum; after that the vaginal vault and cervix. A large sterile speculum will easily bring the parts into view.

This report is offered as another plea for the early recognition of the seat of puerperal infection.

As time does not suffice to make a bacteriological search for the particular micro-organism existing, it is therefore wisest to immediately make a search for the seat of primary inoculation, and if found local treatment should be instituted.

BLEEDING IN PREGNANCY AND LABOR.

BY A. H. FREELAND BARBOUR, M.D., F.R.C.P. (Edin.),

Assistant Physician to the Royal Maternity Hospital, Edinburgh.

GENTLEMEN,—Bleeding is the most serious complication you will meet with in pregnancy and labor. You may be called to a patient who is bleeding to death, and everything depends on your knowing the right thing to do, and doing it at once.

There are many aspects of this subject which we might consider, but I wish to fix your attention on this one,—viz., the treatment of bleeding by plugging the vagina,—and for this reason. We have to deal with bleeding from a cavity, and our first inclination is to plug that cavity. We apply to obstetrics the general principles of surgery that to check loss of blood from a cavity you must plug it. While in one group of cases this is the best thing to do, in another group it is the worst; in some cases it is salutary, in others closely resembling these it is fatal. It is to bring out the contrast between these two classes of cases that I wish you, in considering the question of bleeding, to limit your attention to this one aspect,—its treatment by plugging. In what cases are we to plug the vagina, and in what cases are we not?

Let me give you six illustrative cases in which the contrast comes out. They represent the most important forms in which you will meet with this serious complication in practice. They fall into three pairs,—the first in the early months of pregnancy, the second in the latter months, and the third after the birth of the child.

(A) In the early months of pregnancy.

CASE I.—A. B. had passed three periods and thought herself pregnant. Considerable and persistent bleeding from the vagina. Vaginal examination showed the cervix softened and slightly patent. On bimanual examination the uterus was enlarged to the size of a

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three months' pregnancy. The vagina was plugged, and ergot administered internally. On the day following the plug and ovum were expelled.

A I.   *A* II.
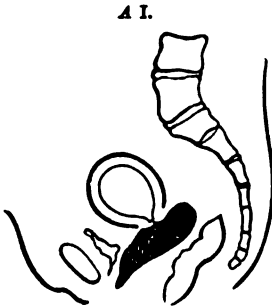
Vagina plugged for hemorrhage at third month.   Piece of decidua projecting from os.

Case II.—A. B., after passing two periods, began to bleed from the vagina, portions of tissue being expelled with blood-clots. Vaginal examination showed the os patulous with a piece of decidua projecting from it. On bimanual examination the enlargement of the uterus did not correspond to the number of periods passed. The cervix was dilated and a portion of decidua removed with the finger, and a hot antiseptic intra-uterine douche given.

(*B*) In the later months of pregnancy.

Case I.—A. B., a multipara, in the seventh month of her pregnancy, began to bleed from the vagina. No cause could be assigned for the bleeding, which began in bed one night without any special exertion the previous day. This first bleeding was slight and ceased of its own accord. Some weeks later a second and more serious bleeding took place, also without any assignable cause. On vaginal examination, the finger passed through the cervical canal, touched a spongy piece of tissue instead of the membranes, apparently the placenta.

The vagina was firmly plugged, and after some hours this was removed, and a Barnes's bag introduced to plug and dilate the cervix. On the removal of this bag there was free bleeding. The hand was rapidly introduced into the cervix, the membranes ruptured, the leg of the child laid hold of and pulled down, to plug and dilate the cervix still farther, after which no blood was lost.

Case II.—A. B., in the sixth month of her pregnancy, was skating on the Braid ponds; she fell on the ice, and feeling faint

afterwards had to go home. The same afternoon there was some bleeding from the vagina with occasional attacks of faintness. When I saw the patient the following morning the cervix was partially dilated. As the bleeding was continuing, I passed a finger through

B I.   *B* II.

Vagina plugged for hemorrhage at seventh month.

Partial dilatation of cervix at sixth month.
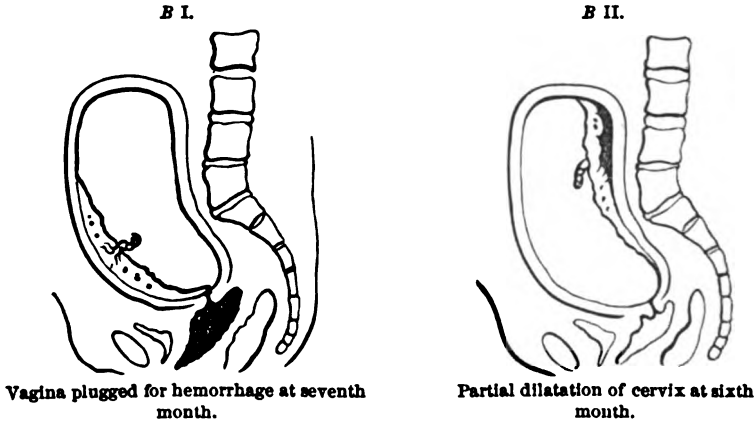
the cervical canal and ruptured the membranes. After this the bleeding ceased, and the contents of the uterus were expelled next day.

(*C*) After the birth of the child.

CASE I.—A. B., multipara, went into labor in the eighth month of pregnancy, the membranes rupturing prematurely, and the cord becoming prolapsed. To hasten delivery, the cervix was artificially dilated and the child extracted by turning. In the process of extraction the cervix contracted firmly on the neck of the child. In delivering the head a tear was made extending into the left fornix. From this free bleeding occurred, although the uterus was well contracted. As the bleeding was not checked by the injection of water at 120° F., the vagina was firmly plugged with iodoform gauze. The nurse was instructed to sit beside the patient for two hours, with her hand grasping the fundus uteri and pressing it downward against the vaginal plug.

CASE II.—A. B.; after the birth of the placenta, bleeding began from the vagina. The uterus was soft and flabby, and on grasping it through the abdominal wall masses of blood-clot were expelled. As the uterus could not be made to contract by grasping it externally, the right hand was cleansed, made antiseptic, and passed into the

vagina, so as to grasp the uterus between the hands. At the same time, the glass nozzle of an intra-uterine douche was passed along the right hand, directed into the uterus, and a stream of water at 120° F. thrown into the uterine cavity. The uterus at once contracted firmly

c I.　　　　　　　　　　　　　　　c II.
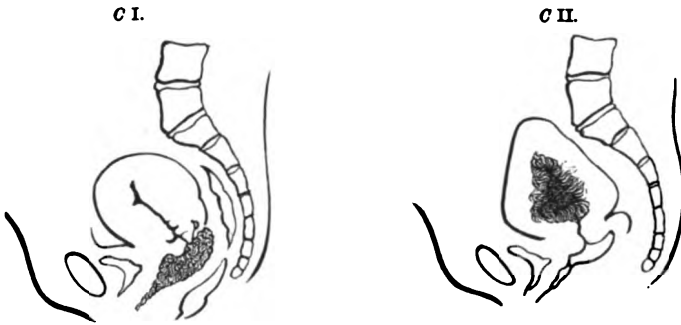
Vagina plugged for hemorrhage after delivery.　　Uterus containing blood-clots after delivery.

and the bleeding ceased. Four grains of ergotin were administered hypodermically.

These six cases include the most important types of bleeding in pregnancy and labor. I have grouped them in pairs because the members of each pair have much in common, resembling each other in the time at which the bleeding came on, and in other features which we need not consider now. They differ in this important fact, that in the first of each pair the vagina was plugged, while in the second it was not. To have plugged the vagina in *A* II. would have done no good; in *B* II. would not have been as efficient as the means adopted, and might have had serious results; in *C* II. would have been fatal.

To understand how this is, we must look at the source of bleeding from the uterus in pregnancy and labor, its mode of arrest, with the principles of treatment deduced from these.

1. *Source of Bleeding from the Uterus in Pregnancy and Labor.*
—In the early months of pregnancy, bleeding takes place from the whole of the uterine cavity. It is lined by the hypertrophied decidua, which is at this stage vascular throughout. If, therefore, it becomes detached over any portion of the uterine wall, or if the whole has been stripped off, save one fragment left semi-detached, you have the possibility of bleeding. In *A* I. the bleeding probably occurred from the lower pole of the uterus, over which separation of

the decidua had taken place in connection with a partial dilatation of
the cervix.   In *A* II. bleeding occurred from semi-detached frag-
ments of decidua left within the uterus, or from the general
uterine surface through the fragments of retained decidua retarding
the retraction of the uterine wall.

In the later months of pregnancy bleeding takes place only from
that part of the uterine wall on which the placenta is present. I need
not remind you that while the decidua over the uterine cavity
generally atrophies as pregnancy advances, one portion of it—
the decidua serotina—becomes hypertrophied and vascular, forming
the maternal portion of the placenta. If a patient bleeds in the later
months of pregnancy, the blood must be coming from the placental
site. This implies that the placenta has become separated. It is in-
teresting to note that the situation of the placenta and its mode of
attachment are such that no separation, and therefore no bleeding,
can take place under normal circumstances in the later months of
pregnancy, or in connection with the onset of labor. If there is
bleeding in the later months of pregnancy or at the onset of labor,
and practically we cannot separate these, as the bleeding and the
threatening of labor often go together, it means that either a nor-
mally situated placenta must have been detached as a result of vio-
lence or of disease, or that the placenta must have been abnormally
situated.

The cases *B* I. and *B* II., given above, are illustrations of these
two causes of separation of the placenta.

In *B* II. there was separation of a presumably normally situated
placenta, as the result of a fall on the ice; it was a case of *accidental
hemorrhage*, as is evident from the history of a violent blow followed
so shortly after by the bleeding that the one was evidently the cause
of the other. *B* I. was a case of *placenta prævia*. The separation
here was due to a threatening of labor, which from the abnormal
situation of the placenta meant separation and bleeding. A glance
at the diagram will make plain the difference between these cases.
They resemble each other in the period of pregnancy at which the
bleeding occurred, and in the fact that in both the placenta is sepa-
rated. They differ in the cause of its separation.

The third pair of cases have this in common, that the bleeding
took place after the birth of the child. In *C* I. it was from a torn cer-
vix, which is rarely a cause of serious bleeding. Post-partum hemor-

rhage usually occurs from the placental site. It is from the large venous sinuses unprovided with valves which are torn through, in connection with the separation of the placenta, that the bleeding which proves so rapidly fatal takes place. The other torn surfaces are the perineum and cervix, which form the two contracted parts of the genital tract; and unless the normal dilatation occurs, they tear. A torn perineum from the size of the vessels rarely causes serious bleeding; so, also, tears of the cervix, which invariably occur, are seldom of consequence. It is only when the rent is extensive, as happens in the case of forcible delivery through an undilated cervix, that a torn cervix causes serious bleeding.

It is the placental site, then, that we instinctively think of in cases of dangerous bleeding. This site occupies fully one-third of the walls of the uterine cavity, a cavity which can fill up with blood enough to kill the patient without much bleeding taking place externally. It is this fact which makes post-partum hemorrhage such a serious condition; not merely that the bleeding takes place from an extensive vascular surface which is difficult to get at, but that we may be misled as to the amount lost. Bleeding from the uterus may be in great part concealed.

2. *Its Mode of Arrest.*—So much for the source of the bleeding. Look now at its mode of arrest, natural and artificial. This will be best considered under the following heads:

(*a*) The formation of blood-clot.

(*b*) Contraction of arterioles, excited by ergotin and hot water.

(*c*) Pressure on the placental site—only effective when the uterus has been emptied.

(*d*) Uterine contraction *and retraction.*

(*a*) Clotting of blood at the orifice of a torn vein, or in its course, is an important natural cause. It is interesting to note that it occurs spontaneously in the normal placental site before labor has begun. This spontaneous thrombosis, produced by giant cells finding their way into the venous sinuses, while not so extensive as to be of great practical importance, is of scientific interest as Nature's preparation to meet the dangers consequent on separation of the placenta. Thrombosis also explains the arrest of the occasional bleedings from placenta prævia; here labor threatens, some veins are torn through, and bleeding occurs, but is arrested by thrombosis after the threatening has passed off. It is at the placental site, post partum, that we

see the significance of thrombosis. You have only to look at the blood-clot in the veins on the inner surface of a recently delivered uterus to realize what an important part they play.

In connection with the formation of blood-clot, the composition of the blood must also be a not unimportant, though obscure, factor. It is interesting that the composition of the blood alters in pregnancy so as to favor its coagulation. In cases of phosphorus-poisoning, in which the blood is more fluid than normal, bleeding from a well-contracted uterus has been observed. And in some peculiarity of the blood we have the probable explanation of a tendency to bleeding which runs in members of one family.

(b) Contraction of arterioles as excited by ergotin and hot water is of practical importance. Ergotin has a double action. While its effect on the muscular fibre of the uterus as a whole is the more important, it also acts on the muscular coat of the arterioles. Dr. Helme found that on passing water containing ergotin in solution through the blood-vessels of the uterus of the rabbit, contraction of arterioles resulted. Hot water has a similar twofold action. In addition to its stimulating the muscular wall of the uterus to contract, it causes a contraction of the muscular coat of the arterioles. So that even though the stream of hot water does not make the uterus harden under the hand, it will blanch the bleeding surface. The contraction produced by heat, is, as Dr. Milne Murray has demonstrated, more lasting than that produced by cold. To have this effect the water must be at 120° F.,—that is, about as hot as the hand can stand. Water at a lower temperature favors bleeding.

(c) Pressure on a bleeding surface is a means of arrest frequently employed in surgery, but from the situation and relations of the placental site, it is obviously very difficult to make full use of it. To begin with, it cannot be exerted until the uterus is emptied of its contents, as these prevent effective counter-pressure; and after their removal it is difficult to get the placental site fairly between the hands. Pressure on the uterus would not often be of great value, were it not for its additional effect in stimulating the uterus to contract. It is possible, however, to exert a certain amount of pressure on the placental site when it is situated low down, as in placenta prævia. In direct pressure we have the *rationale* of plugging the vagina and cervix in placenta prævia. After delivery, also, we can directly compress the placental site by grasping the uterus with both

hands, with one externally and the other in the vagina, or, better still, in the uterus.

(d) Uterine contraction and *retraction* form the only efficient means of arrest. I mention them together because contraction passes into retraction, and have put the latter in italics as forming the efficient part of the process. The difference, as you know, between the muscular wall of the uterus and that of other viscera—*e.g.*, the bladder—lies in the fact that in the expulsion of its contents a contraction is followed by retraction. In pregnancy the uterine muscle behaves like the bladder muscle. It becomes shorter and thicker during the contraction, thins and elongates after it has passed off. In labor, however, as the contents leave its cavity, the muscular wall of the uterus becomes progressively and permanently shortened and thickened. This process is technically known as retraction. Contraction is temporary and intermittent; retraction is continuous and permanent.

While contraction is of importance as leading up to retraction, the latter is the important factor in the stopping of bleeding. How it does so we do not exactly know, but it is evident that the permanent shortening and thickening of the uterine wall implies a rearrangement of the muscular fibres with consequent compression of the blood-vessels, passing through the mesh-work of their fibres. It is a natural process of ligature, and it is interesting to note that retraction occurs to a slight extent before, and still more, *pari pasu*, with the separation of the placenta. Ligature of the vessels takes place in this case before amputation, and thus all risk of bleeding is prevented. As regards contraction plus retraction, will you remember these three facts: that it is the only efficient means of stopping bleeding from the placental site; that it can only occur when the uterus is emptied of its contents; and that it is excited by grasping the uterus, by ergotin, and especially by hot water.

3. *The Principles of Treatment of Bleeding.*—We are now in a position to understand the principles of treatment suggested by the foregoing anatomical and physiological considerations. Let us return to our illustrative cases. The question to be answered is why we plugged the vagina in the one case and not in the other.

In *A* I. we plugged because plugging the vagina controls the bleeding, for at that period of pregnancy the uterus cannot expand with blood. Further, the natural arrest follows expulsion of the con-

tents, and all that is required is to minimize the loss of blood in the mean time.

In A II. we did not plug because it would have done no good. We might plug to temporize until we were ready to clear out the uterus, but plugging is not a necessary part of treatment.

Passing now to the second group of cases, in which you must remember that you have a uterus which can distend with blood, let us consider our treatment. For placenta prævia (B I.), where the bleeding can be controlled by plugging the vagina, or better still by plugging the cervix either with a Barnes's bag or the leg of the child drawn down, plugging is not only the best, but the only treatment; and plugging the cervix has the advantage over plugging the vagina, that the plug also dilates.

In B II., where the placenta was situated over the upper portion of the uterus, and has been detached as the result of violence, we have an entirely different set of conditions. To plug the vagina there might simply mean to prevent your seeing blood coming away. The patient may still bleed into the uterine cavity and die from it. For accidental hemorrhage, the treatment is to rupture the membranes; the escape of liquor amnii sets up uterine contraction and retraction, and the patient is safe. In speaking of rupturing the membranes as the only treatment for accidental hemorrhage, I am stating my own conviction; for you will find that some authorities recommend plugging the vagina here also. They do this on the ground that the uterus is not likely to become distended further with blood, when it has liquor amnii and a fœtus already within it. The logic of facts is, however, against this treatment. Patients have bled to death internally; therefore I advise you, on going into practice, to regard rupturing the membranes as the only resource in those cases of accidental hemorrhage in which the symptoms of loss of blood are so marked as to call for interference.

In the third group of cases, in which bleeding took place after delivery, we plugged in C I. because the vaginal plug compresses directly the bleeding cervix. In such a case hot water should be tried in the first instance, but if it fails, plugging is the best treatment. Some have recommended stitching the laceration, but this is not easily done. When the vagina is plugged in this case, the uterus must always be controlled by the hand for some time, to make sure that it does not fill up with blood above the plug. I have mentioned

this exceptional case of plugging the vagina for post-partum hemorrhage, merely to contrast it with cases like *C* II., which form by far the greatest proportion of the dangerous cases of this variety of bleeding, and in which plugging the vagina is fatal.

To plug the vagina in nine-tenths of the cases of dangerous bleeding after delivery, of which *C* II. is an example, is simply to hide the loss of blood. The uterus fills up with blood, and the patient dies. The only treatment is to induce uterine contraction and retraction. In a bad case of post-partum hemorrhage one instinctively grasps the uterus at once through the abdominal wall, or, if this fails, bimanually. This squeezes out the clots and shows how much blood has been lost. It also stimulates the uterus to contract. As a means of direct pressure on the placental site it is not effective; to produce this the closed fist of the internal hand must be passed into the uterine cavity,—a procedure which one rarely has recourse to,—or the uterus may be packed with iodoform gauze. Of equal importance with grasping the uterus is the injection of hot water, which is the most rapid and most certain stimulus for uterine contraction. Ergotin takes longer to act, but is invaluable in maintaining uterine contraction.

In the treatment of post-partum hemorrhage, all the four means of arrest come into play. Grasping the uterus acts partly by direct pressure, chiefly by exciting contraction. Hot water and ergotin act partly on the arterioles, chiefly also by exciting contraction. Contraction plus retraction, therefore, excited artificially is the great factor, aided by thrombosis—a natural process beyond our influence. Plugging which, owing to the greater frequency of placenta prævia, is so prominent in the bleeding of pregnancy, sinks into insignificance in the treatment of bleeding after delivery.

We thus see that, in studying bleeding from the obstetrical standpoint, there are three periods in which it occurs,—early pregnancy, late pregnancy, and after delivery; and that each period furnishes us with two sets of conditions which contrast in their treatment. For *A* I., *B* I., and *C* I., plugging the vagina is the treatment, while it is not for *A* II., *B* II., and *C* II.

THE DIAGNOSIS OF ABDOMINAL TUMORS FROM A GYNÆCOLOGICAL POINT OF VIEW.

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GENTLEMEN,—When we think of the many organs which inhabit the abdominal cavity and the growths of various characters which spring from or are intimately associated with those organs, it is no wonder that a correct diagnosis is often difficult, nay, rather, sometimes almost impossible. The chief reason of this is that tumors are seldom typical, as it were. There is so frequently something which ought to be present in the way of symptoms or signs, which in a particular case is absent—some link in the chain missing. The element of doubt is introduced and the diagnosis is thus prevented from being absolutely definite. The object of my remarks is to show how valuable the bimanual examination may be in determining differential characteristics peculiar to this or that tumor. I shall omit all that are not concerned in gynæcological examination. Patients are often most misleading as to the length of their illnesses and the nature of their symptoms. Among many others, I may quote the following illustrative case:

A woman who had ceased to menstruate altogether became gradually stouter, and applied to St. George's Hospital for an out-patient maternity letter. This she received, and about five months after she sent to say she was in strong labor. On the student's arrival the woman certainly appeared to have marked pain—uterine in character—every few minutes. An examination was made: the cervix was small and hard, the uterus could not be clearly made out, and the whole of the lower bowel was loaded with fæces. A good purgative proved sufficient to dispel the patient's weird impression

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as well as the extensive accumulation in the rectum and sigmoid flexure. Then and not till then was she persuaded that the newly made baby clothes were not required.

We must now consider the methods of diagnosis.

1. *External Manipulations and Measurements.*—If the abdomen be large and lax, as much of the skin and fat as possible should be grasped by the left hand, and should be drawn upward (decubitus dorsal) so that the right hand may be able to get behind the mass, and in this way it may be discovered that no tumor is present, whereas on feeling through the abdomen without this method non-existing swellings have been sometimes made out. This is very important, for the fat renders the area dull on percussion,—a fact suggesting the presence of a solid or fluid body. Better still, if the flesh be grasped by an assistant, percussion can be clearly and easily carried out behind it. As said before, dulness indicates solid or fluid. Resonance, as a rule, means intestine, and hyperresonance distended gut or stomach. We note whether the abdomen is firmer in one part than in another, whether any distinct mass can be felt, and if so whether it appears to be solid or fluid, irregular in outline, or if impression can be made on it by pressure.

The following measurements must be taken: Pubes to umbilicus; umbilicus to xiphoid. Pelvic tumors,—*i.e.*, those which arise from the pelvis,—as a rule, render the lower line longer, while the upper line is specially lengthened by growths originally from above. The distance from the anterior superior spine to the umbilicus should be practically equal on the two sides. Increase of either will indicate a one-sided swelling. In the case of a large one-sided tumor the measurement from umbilicus to spine on the affected side will be also increased in comparison. The calipers, as a rule, are useless in the diagnosis except as far as an increasing or decreasing prominence of the abdomen can be approximately determined by them. Shape varies much according to the position of the tumor. Again, sometimes alterations are caused by moving a patient from the dorsal to the lateral position.

2. *Auscultation.*—What are the sounds to be heard in different conditions "per abdomen"? (*a*) Beating of blood-vessels,—*e.g.*, aorta, fœtal heart; (*b*) bruits,—*e.g.*, in the pregnant uterus, fibroids; (*c*) flatus in intestines, maternal or fœtal; (*d*) scraping sounds caused

by movement of tumors affected by respiration. (The effects of respiration on tumors of course depend upon whether they grow from above or below. In the first case any diaphragmatic attachment, direct or indirect, will cause very distinct movement; in the second case, the movement will be only slightly noticeable.)

3. *Pain and Tenderness.*—Uterine pain being specially felt in the back, ovarian pain in the region of the sacro-iliac synchondroses and down the thigh, and tenderness over any organ affected.

4. *Bimanual Examination.*—Is the cervix high or low? Is it central? Is there any softening? Can the uterine body be distinctly made out by itself? Does the uterus appear to form part of the mass? What information does the sound give? Are the fornices on each side empty? Is there any resistance in Douglas's pouch? If so, is it hard or soft? Does movement of the tumor, if there be one, affect the cervix intimately, or only to some degree? The importance of these questions is readily understood.

The most satisfactory way of dealing with this question of diagnosis in a lecture is, I think, to give a list of the many swellings seen or felt "per abdomen," the probable nature of which may be established, or if not, at all events, aided by a bimanual examination "per vaginam." A very essential possession in an attempt to solve an abdominal puzzle is a good anatomical knowledge of the normal pelvis, its conformation, and the relation of the structures to one another. In other words, every organ must be considered separately as to its being part of the tumor or not. (The difference between innocent and malignant disease in abdominal tumors is often quite undeterminable, especially if the usual cachexia of the latter is not present. Very often only an exploratory incision will settle the question. Exploration should only be fraught with danger when pregnancy is present.) The principal tumors are as follows:

1. *Distended bladder*, rising possibly to umbilicus, but not beyond, owing to urachus; cystic; resonance in flanks. This condition is often felt "per vaginam" to be caused by and associated with impaction of some mass in the pelvis; for instance, the gravid uterus retroverted, a fibroid, or even an ovarian tumor entirely or partially solid. Drawing off the urine and disappearance of the tumor will determine that the case is one of retention.

2. *Uterus.*—(a) *Pregnancy:* Usual signs according to height above pubes plus history of amenorrhœa, not forgetting that some-

times menstruation occurs during the first, second, or even third periods after impregnation. (*b*) *Hydramnios:* Signs according to size, history of pregnancy, very rapid growth, faint or, more likely, absent fœtal heart sounds, owing to death of fœtus. The following illustrates a case in the wards: "Abdomen apparently full of fluid, dulness everywhere, uterus cannot be made out, no change of dulness on movement, history of amenorrhœa, cervix quite soft." (*c*) *Hydatid mole:* Tumor, evidently uterus, soft; special well-known discharge. (*d*) *Fibroid:* Hard, nodular, heavy; no tenderness as a rule; movement of tumor externally intimately affects cervix. Sound generally passes more than normal length. Often metrorrhagia, menorrhagia, or cervical catarrh as signs. Bearing-down pains. N. B.—Fibroids, of course, may grow from other parts than the uterus.

3. *Ascites.*—Dulness in flanks altered by movement, fluid in Douglas's pouch if ascites not enclosed.

Encysted ascites is most often due to *tubercular peritonitis.* Most obscure. Diagnosis greatly aided if any signs of tubercle present in the lungs. Ascites in delicate young patients strongly suggestive. Often forms a localized tumor, some thrill on percussion; and what I have found an important sign is that pressure over the matted intestines, enclosing as they do pools of extravasated serum, gives a gurgling, grating sensation to the touch. If uterus is much affected, sound may pass through on ordinary manipulation. Bimanually, the same signs. Ordinary peritonitis may cause encysted ascites.

Malignant Disease of Peritoneum.—An indefinite mass giving no special characteristic feeling to the touch, rapid growth, not tender; appearance of patient perhaps cachetic.

Subperitoneal Sarcoma.—No signs "per vaginam" except the large mass lying posteriorly, and growing forward.

4. *Ovarian Tumors.*—Cystic or solid: (*a*) Cystic, generally multilocular, so that tense irregularities are sometimes felt from the presence of secondary cysts within or without the tumor. Mass "typically" more on one side of abdomen than the other. A sulcus felt between uterus and the swelling. Cervix affected to a variable degree by movement of tumor. (*b*) Solid ovarian growths, fibroma or fibro-sarcoma, similar relations to uterus, but more weighty and, as a rule, harder. (*c*) Dermoids take on active growth usually at

puberty, a few years after which they become noticeable. They are not usually larger than a fœtal head. Generally discovered in young people, though seen at any age. However, this fact, that, as a rule, they are found in young people, is a strong point in helping to determine their nature. They are often adherent in Douglas's pouch, and to the touch are irregularly hard and soft, especially if any degeneration has taken place. Sometimes a piece of bone or tooth may be felt projecting from the tumor.

5. *Broad Ligament.*—(*a*) Parovarian or simple broad ligament cysts originating from one of the scattered tubules. Signs: In situation of broad ligament, moving with it; not tense, as a rule; thrill easily obtained from abdomen to anterior and lateral vaginal fornix of affected side on account of thin fluid, and also because the tumor is unilocular. (*b*) *Parametritis:* History: Often occurring after abortion or septic pregnancy; tenderness; high temperature, commencing with rigors; may become parametric abscess, which if left points externally or into bladder or vagina. (*c*) *Extra-uterine pregnancy:* History of a case usually amenorrhœa followed by sudden collapse; rupture of sac into broad ligament, forming a (*d*) *hœmatoma*, which feels at first boggy, becoming harder by degrees; or if the extra-uterine gestation continues to develop, signs of fœtal life and advancing pregnancy occur; uterus felt separate. Passage of decidual membrane probably. This latter is not by any means essential. Hœmatoma may arise from rupture of a varicose vein unconnected with ectopic gestation. (*e*) *Tubal tumors* will be dealt with separately.

6. *Tumors in the Peritoneal Cavity.*—(*a*) *Abdominal gestation:* There may be a history of a ruptured tubal pregnancy or the abdominal variety may be primary. Signs of pregnancy and the symptom amenorrhœa. Softening of the cervix is often absent in all forms of extra-uterine pregnancy. In a primary abdominal variety the mass grows, and after the usual period of time movements are felt and the fœtal heart-sounds are obvious. The uterus is generally in front; the sound may be passed without danger in the abdominal gestation. There are frequently shows of blood. The fœtal parts may be felt. Development may continue to full time. The fœtus then dies and may undergo various changes,—calcification, maceration, gangrene, suppuration, etc.,—and parts of the gestation sac

may be expelled through abdominal wall, vagina, bladder, or rectum.

(b) *Hæmatocele* is an encysted collection of blood in the peritoneal cavity. (N.B.—Some authors speak of intra- and extra-peritoneal hæmatoceles. The term hæmatocele is, I consider, more suitable for the intraperitoneal variety, and hæmatoma for the extraperitoneal.) Hæmatocele is generally due to the rupture of an extra-uterine tubal pregnancy, though there may be other origins of the collection of blood. The important point is that first of all there is free blood in the peritoneal cavity; afterwards it becomes encysted by setting up localized peritonitis. Hæmatocele is often very difficult to diagnose,—a mass pushing the uterus forward, not tender, soft, the pressure of the finger not leaving a depression, as in fæcal accumulations, becoming gradually more solid, until it may be even of stony hardness, the temperature being normal (unless suppuration occurs); all these are important factors.

(c) *Perimetritis* often forms a swelling in Douglas's pouch in some respects very similar to hæmatocele. The chief differences are: no collapse or history of internal hemorrhage, no rapid onset of symptoms, as a rule, but temperature above normal, and pulse increased, mass very tender, generally displacement of uterus except in the variety in which the uterus is the centre of a large deposit. Another typical situation of perimetric swelling which may be felt "per abdomen" is in the right or left posterior quarter of the pelvis, the appendages being generally implicated. Perimetric masses may suppurate, and if left alone may burst either into the intestine (most commonly) or through the abdominal wall, occasionally into the vagina.

7. Fallopian tube tumors are hæmatosalpinx, pyosalpinx, hydrosalpinx, tubal pregnancy. The enlarged tube is by no means always the characteristic sausage-shaped swelling, but the less distended varieties often have this form. Pyosalpinx is a condition which is often distinguished "per abdomen" as a tumor, and the tube distended with pus is generally matted together by adhesions into a very irregular mass. The diagnosis is impossible without vaginal examination, as a rule. Then the situation of the swelling in relation to the uterus, passing as it does more or less from the upper corner of the side of the uterus towards one or other sacro-iliac synchondrosis, and being limited by the upper margin of the broad ligament,

and, in general, movable with the broad ligament. In very severe cases the pyosalpinx forms the centre of extensive pelvic inflammation. In such cases a mass is felt on one side of the uterus, usually tending towards one or other posterior quarter. The patient feels considerable pain, there is tenderness over the mass, the temperature gradually becomes more and more septic in character. There is a sort of attack of pain, tenderness, and fever for a time, and then subsidence of symptoms as in appendicitis, followed at some future date by similar signs and symptoms.

The majority of the tumors which may be felt "per abdomen" have been enumerated, and sufficient has been said, I hope, to show how much a bimanual examination may aid us in diagnosing difficult cases.

THE ADVANTAGES OF AXIS TRACTION FORCEPS.

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GENTLEMEN,—There is perhaps no more interesting subject in obstetrics than the history of the forceps. Their invention and clandestine employment by the Chamberlains in the end of the sixteenth century, their probably fraudulent sale to Roonhuysen in Amsterdam, and their chance discovery two hundred years later in the old house of their inventors, who had died without their secret being discovered, all form a sequence of events for which it is difficult to find a parallel without trespassing on the mythical field of ancient "lore."

Equally interesting and instructive is the subsequent evolution of the instrument, of which the development of the pelvic curve and change of lock, as proposed by Smellie, and the addition of the knees, shanks, and shoulders, by J. Y. Simpson, form the most striking early improvements among innumerable other modifications.

These, however, all pale in comparison with the addition of axis traction rods, as devised by Tarnier in 1877. By this scientifically simple modification the practice and teaching of Obstetrics has been radically changed, if not revolutionized, and the safe delivery of living children made now possible, where nothing short of embryulcia could previously be considered. The adaptation of traction rods to any form of forceps is so simple that they may be added to any instrument. Thus in Scotland, where previously the Simpson forceps was most frequently used, the rods have been added and form the type most generally adopted.

In the present instance it is mainly my intention to discuss the advantages gained by the use of the axis traction instrument in detail. These may be regarded as follows:

1. *Ability to pull in Axis of the Brim.*—This, as the name

implies, was undoubtedly the main intention of the inventor in devising the instrument, and certainly forms one of the chief advantages. Previous to its adoption, traction in the axis of the inlet was a physical impossibility, as must be apparent when it is remembered that the direction of this axis is as nearly as possible a line drawn from the umbilicus to the tip of the coccyx. With ordinary forceps, therefore, the foetal head, when grasped above the brim, could not be dragged into the pelvic cavity without much superfluous energy being used from the misdirected force applied pulling it against the symphysis pubis. By this means not only was it impossible to deliver the child when any but the slightest degree of variation existed between the passenger and the passages, but even in these cases much injurious pressure was made on both the maternal tissues and the foetal head. Little wonder then at the frequency of craniotomy and the prevalence of vesico-vaginal fistula, which fortunately now is becoming a condition but rarely met with.

From the comparative ease with which the head can be dragged through the brim, the adoption of axis traction has completely changed the method of delivery in flat pelves. Not fifteen years ago version held almost undisputed sway in the management of this complication, the idea of forceps in such cases being evidence of the grossest ignorance and malpractice. Now, however, axis traction forceps can be used in the delivery of these cases with no increase of risk to the mother, and with such diminished mortality to the child, as compared with turning, that their adoption is at all times to be recommended. I have on several occasions thus, comparatively easily, delivered living children through a flat pelvis with a conjugata vera of certainly not more than three inches, while there are recorded equally successful results with a conjugata vera of but two and three-quarters inches, which is the lowest limit claimed for "turning."

Before axis traction was used there was no gainsaying against turning as the preferable method to adopt in delay from a flattened pelvic brim, as with this form of contracted pelvis we almost invariably have an inclination of the axis of the brim in front of that of a normal pelvis, and thus the direction of traction requires to be made still farther back. If, then, it be true, as has been computed by Tarnier, that in a normal pelvis every thirty pounds of force which tends to depress in the proper axis is accompanied by twenty-six pounds of

force expended on the pubis, it will be obvious that the amount of ineffective force as compared with effective force will be greatly increased when we deal with a flat pelvis. An erroneous argument at that time was also used, that from the antero-posterior grip of the fœtal head, which we of necessity get, from the occipito-frontal diameter lying in the transverse diameter of the pelvic brim, compression of the head caused a bulge in the biparietal diameter, which thus prevented its passage through the contracted conjugate. This theory, however, has been effectively disproved by Milne Murray, who has demonstrated that the compensatory increase in the fœtal skull when compressed antero-posteriorly occurs in the vertical and not in the transverse diameters.

2. *The Normal Mechanism remains unhindered during Traction.*—In this, perhaps, we have the greatest benefit from the use of the axis traction instrument in the majority of cases. Comparatively, it is but seldom we meet with such disparity between the presenting part and the bony canals that obstruction at the brim is met with; the vast majority of cases in which artificial delivery is demanded being due to delay in the cavity or at the outlet. If normal labor be considered as it should, as an accommodation process between a rigid irregular ovoid (the fœtal head) passing through an irregular rigid bony canal, it will be apparent that, if traction force is necessary for delivery, such must be most effective and least injurious if carried out under principles which allow during the period of traction of a ready accommodation to occur between the passenger and the passages. By means of the swivel joint on the axis traction instrument this normal mechanism or adaptation is in no way hindered, while in other forceps, a grip of the presenting part having been secured, traction is applied and forced delivery accomplished in a manner similar to drawing a cork out of a bottle. It may be argued that the scientific accoucheur may use discretion in rotating the part grasped as he thinks desirable; such at all times must be haphazard, as it is absolutely impossible to have any definite idea what the correct relationship should be; in fact, attempts at forced adaptation are as likely to be erroneous as the reverse, and they thus are frequently more injurious than beneficial, and should be decried.

This important benefit of axis traction forceps is well exemplified in the gross by the anterior rotation during traction of the occiput when posterior, or the anterior rotation of the occiput after the

head has passed the brim in a rachitic flat pelvis where the head is grasped in the occipito-frontal diameter, but it is chiefly in the finer degrees of adaptation that the value of the instrument is most frequently apparent; the slightest degrees of rotation, extension, or flexion may make the greatest difference at the outlet, and thus, from conserving the finely balanced relationships, we may prevent the occurrence of tears of the perineum and other untoward complications.

In this respect one must entirely demur from Tarnier when he suggests that after the head reaches the outlet the application handles are to be used for the subsequent delivery. It is here that the instrument has its most patent benefits, as will more particularly be demonstrated under the next heading.

3. *Automatic Indication of the Correct Direction for Traction.* —As has already been shown, the importance of pulling in the axis of the brim undoubtedly led Tarnier to devise the instrument so that injurious pressure and loss of power from misdirected force might be minimized. Equally important is it, however, that axis traction be continued throughout the entire parturient canal. To attain this with the older forms of forceps, the accoucheur had to depend entirely upon his own conception of the probable direction of the pelvic curve, which might be altogether wrong. With the axis traction instrument, however, by watching the varying inclination of the application shanks, and pulling with the traction rods always parallel with these shanks, we can reckon, in the majority of instances, that our traction is correct as far as direction is concerned.

Nothing can be more convincing of this advantage than to watch the behavior of the application handles as the pelvic outlet is reached. Their somewhat sudden passage forward as the occiput becomes freed from the pubis in front and extension commences, with their subsequently slow continuation in the same direction as the extension movement becomes completed and the sinciput glides over the perineum, is an object-lesson at once instructive and interesting.

If, then, we follow the movements of the application shanks and pull with the traction rods parallel to them, there can be no doubt that we are in no way interfering with the normal complex movement of extension, but are merely supplying an increased force to aid delivery. It is idle to think that even the most expert obstetrician can artificially in any way approach by a mere knowledge of the

movement of extension, and the general direction of the pelvic outlet, the exactitude which is thus so effectively demonstrated. But the proof of the pudding is the eating, and there is no denying the fact that laceration of the perineum is with the use of axis traction forceps but rarely met with, as compared with its almost unpreventable frequency with the use of previous instruments. It is, indeed, lamentable to see recommended "forceps with adjustable traction rods, so that they may be removed when not required, as in 'low' operations." It is just these "low" operations which form nine-tenths of all forceps deliveries, and in which the great benefits of axis traction are particularly required, so that perineums may be saved, and thus the mother not exposed to the immediate risks of external wounds becoming septic and the remoter ills of prolapse. Axis traction through the bony canals is undoubtedly valuable, but errors in the direction of traction here are by no means fraught with the same elements of danger as at the outlet, where the fœtal head is surrounded by merely the soft structures of the pelvic floor projection. To grasp the application handles with the head at the perineum is at first undoubtedly tempting, but it is merely to spoil the scientific value of the instrument; better far to have forceps with adjustable application handles, so that they may be removed if any desire be evinced to grasp them after traction has been commenced, than to have adjustable traction rods for the reason just referred to.

4. *Less Compression on the Fœtal Head is exercised.*—This advantage is too apparent to require detailed explanation. With ordinary forceps, either when a wide grip of the fœtal head is taken or where the head is abnormally large, the handles of the instrument will be found widely separated. On grasping the handles for traction purposes compression will at once be instituted, and the stronger the traction the greater will the compression become. The compressive force is estimated at half the traction force. It will thus in difficult cases act injuriously on the fœtal head. From the absence of any force being applied to the application handles, all traction being made through the traction rods, it is evident that in the axis traction instrument this danger is absolutely avoided. It is probable that previous to axis traction, in the delivery through flattened pelves, this severe compression on the fœtal head was the cause of the heavy fœtal mortality, for the occipito-frontal grip necessarily caused a wide separation of the handles and disposed to a fatal result from the

severe compression which could not be avoided when strong traction was made.

5. *Greater Traction Force can be applied.*—This has been cited by some of the opponents of axis traction as a disadvantage, in so far that so great force may be used that dangerous results may accrue; doubtless in the hands of a blacksmith, or other similarly untrained individual in the obstetric art, such a contingency might arise. It might with equal cogency be argued that razors should not be used for shaving, as one might cut his throat.

That greater traction force can be exerted, quite consistent with safety, than with the older forceps is undoubted, as the traction is not misdirected. Further, we can more readily determine the possibility of extraction in any given case, as we are aware that the force exercised is not misdirected, and if after a few trials we find that no progress is being made, other methods of delivery can be conscientiously substituted. In this lies more than a trivial advantage. It is but too true that the tendency exists to postpone unduly the performance of more energetic measures such as symphyseotomy or craniotomy, and from this the welfare of the mother may materially suffer. With the older forceps we were fostered in our procrastination by the knowledge of their insufficiency, thinking that perhaps by some particular manœuvre we had not tried we might succeed in delivery. With the axis traction instrument, on the other hand, where no manœuvres are available outside well-directed and steady traction, a few energetic but futile attempts will readily demonstrate that further use of the instrument will be unavailing and it can at once be discarded.

6. *The Blades have Less Tendency to slip.*—From securing the blades on the presenting part by means of the fixation screw, we retain a permanent grip which is quite unattainable with the same degree of certainty in the older instrument. Here the blades are maintained merely in apposition by means of the Smellie lock and the structures at the "girdle of contact;" during traction the grip is tightened, and in the intervals it is altogether relaxed. There is, therefore, constant variation in the strength of the grip which must allow of movement of the presenting part between the forceps blades. Should this be at any time exaggerated, as the result, say, of the induced movement by means of a uterine contraction during the interval of traction, an altered and perhaps insufficient grip may

be substituted which when subsequent efforts at pulling are made will allow of slipping. This, from experience, I found particularly liable to occur during the delivery of the head at the outlet. In the attempt to combine the traction and extension movements here neces-sary, the blades are prone to rotate on the head, and the points to project, endangering seriously the integrity of the perineum.

In this want of movement of the head between the forceps blades we have, however, one of the disadvantages of axis traction, which has to be remembered and rectified. As has already been shown, from the fixation of the blades to the presenting part, we have con-veyed to the application handles all the accommodation movements of the advancing part, and from following the direction of these and pulling with the traction rods parallel to the application shanks, we are directed to pull in the correct axis. Though in the majority of cases this indication is absolutely correct, it may in certain in-stances be otherwise. To take a gross example, it must be evident, after anterior rotation of the occiput in posterior cases, that to con-tinue traction with the pelvic curve of the forceps directed backward would be absurd; we must here remove and reapply; in like manner, after having dragged the head through a flat inlet, and anterior rota-tion of the occiput has occurred, to continue traction with the blades placed antero-posteriorly in the pelvis would be equally erroneous. These examples speak for themselves. But it is similar cases of minor degree that we are apt to overlook, and from experience I have found this to be particularly evidenced in instances where from extremely rigid soft parts or slight contraction in the cavity there is an exag-gerated flexion of the fœtal head present. The head is here grasped in an extremely flexed position, and before delivery can be com-pleted a compensatory increased extension at the outlet is necessary. During this movement the application handles of the blades are necessarily, from their fixed position on the head, directed so far forward that to pull according to rule—viz., with the tractions parallel with the application shanks—is to exercise traction directly against the pubic symphysis. In these instances it is better to remove the blades and reapply, when the correct axis of traction will at once be demonstrated, than to trust to one's own judgment of the direc-tion of traction necessary.

From the foregoing I think there can be little doubt that the axis traction forceps is immeasurably superior to all former instru-

ments, and that its general adoption is to be recommended in all forceps operations. It is indeed strange that with so many points in its favor it has not found more general acceptance at the hands of medical practitioners; but, like all substantial improvements, its progress is slow but sure. During the last twenty years it has entirely overcome the onslaughts of scientific criticism, and will doubtless in due course pass equally successfully the more obstinate obstructions of prejudice. Most gratifying is it to the consultant when, with consummate ease, he, by axis traction, can frequently deliver cases which have cost his conservative brother practitioner much mental anxiety and bodily loss in the form of perspiration and urates. Still more so when one can deliver to a mother a living child, as one occasionally can by these means, when her previous confinements have been terminated by destruction of the child. After a somewhat large experience in the use of both forceps, I now unconditionally recommend the axis traction instrument, and have relegated the other varieties to the show-cases of my museum of obstetric curiosities.

By the benefits which result from the use of axis traction at the outlet in conserving the perineum, when compared with the older instrument, it will be evident that their more frequent application is justified in these cases. It is naturally impossible to lay down hard and fast rules as to the indications of forceps; each case has to be taken on its merits; but there is little doubt that their comparatively early use is to be recommended. It has been decided from statistics that the average second stage of labor in multiparæ is less than one and a half hours, and in primiparæ less than two and a half hours; further it has been clearly demonstrated that delay in this stage is fraught with a tendency to complications both immediate and remote. If this be so, it seems clearly shown that, independently altogether of special indications for the employment of artificial delivery, the termination of labor is demanded within a reasonable time limit, and if we are going to take nature as our guide, this certainly should not be longer than a second stage of two and a half hours in multiparæ and three and a half hours in primiparæ.

I have now for years acted according to this rule in cases where no special causes of delay are present beyond so-called inertia uteri, on the one hand, or rigidity of the perineum, on the other.

It would seem to me that if there is any special indication for the use of forceps at the outlet, it is "rigid perineum." Time after time

have I seen hours of conservative patience rewarded with a complete rupture, the result of an excessively strong uterine contraction.

By the use of forceps and deep anæsthesia one can regulate to a nicety the dilatation of the vulva, and thus prevent the sudden expulsion of the head with its untoward consequences. Not only so, but by this early application the strength of the mother is conserved and much unnecessary suffering avoided. She is thus placed in a better condition to withstand any complications of the puerperium should they unfortunately arise.

"Do as you would be done by" is an excellent maxim, and I have no hesitation in saying, were I a parturient female, my earnest appeal would be for "chloroform and early forceps."

DISPLACEMENT OF THE KIDNEY IN OBSTETRIC PRACTICE, WITH NOTES OF A CASE OF FLOATING KIDNEY IN A MOTHER AND HER INFANT.

CLINICAL LECTURE DELIVERED IN THE MEDICAL COLLEGE FOR WOMEN.

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GENTLEMEN,—Displacement of the kidney is a possible compli-
cation of pregnancy and labor to which few, if any, of the well-
known midwifery text-books refer. Yet such a complication may
have in many instances an important influence upon the progress of
an obstetric case. A misplaced kidney, fixed at or near the pelvic
brim, may gravely interfere with parturition; and the same organ,
when in a floating condition, may give rise to difficulties in diagnosis
not always easy of solution. For these causes it will be not un-
profitable to consider this subject in some detail, especially as at the
present time I have a patient under my care who illustrates certain
of its outstanding peculiarities.

There are three varieties of renal displacement, and each one of
these has an interest from the obstetric stand-point. There is, first,
that form of displacement in which one of the kidneys has a free
range of mobility, and to which the name "floating" kidney is pecu-
liarly applicable; there is, secondly, the lesser degree of renal mo-
bility, which has been designated "movable" kidney; and there is,
thirdly, the fixed displacement, to which the term "misplaced" or
"malposed" kidney has been given. In a general sense, the first of
these clinical varieties corresponds with that anatomical condition
in which the kidney is provided with a mesentery or mesonephron;
the second with that in which the viscus lies entirely behind the peri-

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toneum, which forms no investment for it; and the third with that in which the organ, normal or malformed, single or fused, is found fixed in some abnormal position in the abdomen or pelvis. It is only in a general sense, however, that this correspondence exists, for sometimes a "movable" kidney—*i.e.*, one without a mesonephron— may exhibit a degree of mobility quite equal to that met with in the typical "floating" kidney which has a mesonephron. Again, a "misplaced" kidney may only have become fixed after a period during which it was freely mobile. With this qualification, it may be stated that a freely movable kidney is provided with a meso- nephron, whilst the less mobile organ is not, and that to the former may be given the name "floating" and to the latter that of "movable." Simple misplacement with fixation of the kidney is probably most often truly congenital, but the floating or movable organ, although doubtless congenital in some instances, is more often an acquired state. I shall take up in order these three conditions and consider their bearing upon obstetrics.

FLOATING KIDNEY.

The great degree of mobility which characterizes the floating kidney prevents it becoming a serious danger in midwifery practice, for the organ can usually be easily pushed out of the way. The presence of such a displaceable viscus, however, may lead to diffi- culties in diagnosis of some importance, both during pregnancy and in the puerperium. The following case will serve to illustrate some of the clinical features of such a condition.

I was first called to attend Mrs. M., in the September of 1895. She was then at the third month of her first pregnancy, and on the day previously had had a miscarriage. I found that all the mem- branes had not come away, and I had to scrape them away digitally. She made a good recovery from the abortion. In casting about for an explanation of the abrupt termination of pregnancy I obtained the following history. She was twenty-eight years of age, and had been married for four years. She came of a healthy family, and had herself enjoyed good health till a year previously (1894). Her husband, who was personally well known to me, showed no signs of ill health. In the July of 1894, on her return from a somewhat tiring journey in hot weather on the Continent, during which she

had appreciably lost flesh and weight, she had the first[1] attack of severe pain in the loins. The occasion was an attempt to force a heavy tandem tricycle up a fairly steep hill. As she said, she "did not like to give in," although she felt she was straining herself. The result was a night of intense pain in the back, followed by sickness in the morning. For the three succeeding days the pain continued, she was unable to draw a breath without much suffering, and was evidently seriously ill. Her medical attendant ordered poultices to the back, and made a provisional diagnosis of abscess of the liver. She nevertheless speedily recovered from this attack. A month later, while playing lawn tennis, she had a return of the pain, and then for the first time felt a lump in the abdomen; when handled, this lump disappeared. Again after a long walk she had the same experience. She consulted her doctor once more, and was treated for indigestion, and at that time she had indeed the symptoms of it. Her condition did not improve, and about the end of the year she consulted an Edinburgh physician, who diagnosed floating kidney, and prescribed an abdominal belt and pad. This mechanical treatment gave her perfect relief from symptoms, and six months later she became pregnant for the first time.

Such was the history I obtained from her at the time of the miscarriage above referred to. I had no difficulty in feeling the floating kidney, which showed a very great degree of mobility. It was the organ of the right side; nevertheless, it could be pushed down to the pelvic brim in the middle line, and it could even be displaced into the iliac fossa of the opposite side. It had a distinct reniform shape, was slightly tender on pressure, and could easily be replaced in its normal position. The patient told me that on the day preceding the abortion she had been lifting heavy weights, and it is quite possible that therein lay the explanation of the interruption of pregnancy. At the same time it occurred to me as very probable that the kidney may have slipped down into the pelvic brim and caused compression of the gravid uterus. She had not given up the wearing of the belt.

In the May of the succeeding year (1896) she became again pregnant. The abdominal support was worn till the sixth month, when she had my permission to lay it aside, the pregnant uterus now

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[1] Three years earlier she had a good deal of pain in the same region after a fall down some steps; she was then twenty-four years old.

acting as a sufficient retentive apparatus. On January 14, 1897, her urine was analyzed with the following result: the specific gravity was only 1001; it contained no albumen or sugar; there was .3 per cent. of urea; and the total acidity was .011 per cent. The centrifuged urine gave a slight deposit composed mainly of epithelial squames. I am not inclined to attribute the very low specific gravity to the "floating" character of the kidney; rather the diet of the patient was to be blamed, for I found on inquiry that she was eating very sparingly. Labor pains supervened on January 29; they were never very strong, and the first stage was protracted; the head presented in the normal position, and with the aid of forceps the child, a boy, was born on the morning of January 30. The placenta had to be removed by the Credé method, and during its expression the kidney, which had been lying at the right side of the uterus in labor, was found first at the left side and then on the fundus of the uterus. Had one not known of the existence of the renal displacement, it would have been easy to have mistaken it for the second horn of a bicornate uterus, or for a subperitoneal fibroid. As it was, it interfered very considerably with the grasping of the uterus and delayed the extraction of the placenta. Immediately after the close of labor it was somewhat difficult to distinguish between contracted uterus and displaced kidney. The binder was applied in the usual way, and it was then found that the kidney had slipped up into its natural position in the flank. The puerperium was normal save for a bad attack of hæmorrhoids in the fourth week. Lactation was normal.

A very interesting part of this case remains to be narrated. It refers to the infant. At birth the child, a boy, appeared to be well formed, but a few days later it was discovered that there was only one testicle, the left, in the scrotum. He is now ten weeks old, and during the last fortnight a swelling of the size of a hazel-nut has appeared in the right groin. The right inguinal canal is open at its scrotal end, and doubtless the swelling is the missing testicle on its way through the canal. It is evidently tender, as the infant cries when it is handled. Whilst palpating the testicle I was surprised to find in the right iliac region, in the position normally occupied by the cuput cæcum, a hard mass[1] very easily pushed upward and

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[1] Intestine is also present in this region, but the hard mass is quite distinct from it. It has been decided to remove the undescended testicle.

having a form and size suggesting the infantile kidney. The presence of the large right hepatic lobe, normal at this period of life, prevents a certain diagnosis being formed; but I feel fairly certain that the infant, like the mother, has a floating kidney on the right side. Vaccination has recently been performed, and this has made the child fretful; frequent crying has rendered the presence of the swelling in the side more evident.

This case is of interest as showing how even a freely movable kidney may coexist with pregnancy and labor and yet be the source of no serious trouble. It has, however, to be borne in mind that the presence of the floating kidney was known both to the patient and to myself, and that precautions were therefore taken to prevent it causing trouble during gestation. It was kept in its place by the retentive apparatus till after the sixth month, and it was sought for and replaced immediately after the expulsion of the placenta. Into the question of the cause of the renal displacement in this case I cannot here enter, but that the various falls and strains were factors can scarcely be doubted. Further, it first became manifest at a time when the patient was very thin and when the fat round the kidney may have disappeared. That it was also congenitally predisposed to may be suspected, and the supposition is strengthened by the presence of the same anomaly in the infant. The association in the latter of the testicular and renal displacements is noteworthy when we consider the close embryological relationship of the two organs.

The floating kidney may have relations with obstetric practice other than those met with in the above case. Its presence may, for instance, lead to an erroneous supposition of pregnancy. The movements of the displaced organ may simulate those of the fœtus, and be regarded by the woman as quickening, and the presence of the swelling in the lower part of the abdomen may appear to substantiate her belief. A case of this kind was reported by Day many years ago (*Medical Times and Gazette*, 1864, ii. p. 32), and more recently Desnos and Barié (*Annales de Gynécologie*, vol. xcix., 1876) met with a patient in whom the diagnosis was rendered more difficult by the fact that she had also amenorrhœa from chlorosis. Of course, in all these instances the physical examination of the pelvis and abdomen clears up any doubt that may exist.

A floating kidney when it complicates pregnancy may prove a

real source of danger, as is shown, for instance, by a case reported by Brochin (*Gazette des Hopitaux*, 1875, xlviii. p. 1058), in which a woman at the fifth month of gestation was attacked by a localized peritonitis.   The kidney was found lying at the right side of the fundus uteri, which reached to the level of the umbilicus, and it was intensely painful on pressure.   It altered its position almost every day.   Under treatment the patient recovered, but at one time it seemed as if she were going to miscarry.   The wearing of an abdominal belt gave her relief.   In this case there was a difficulty in diagnosis, the tumor being at first regarded as a uterine fibroid or as an ovarian cyst; but its mobility and other circumstances led to the belief that it was really a floating kidney.   Doubtless the localized peritonitis had its origin in some twisting or compression of the organ due to a change in its relations with the growing uterus.

It is not likely that a floating kidney will cause delay or danger in labor.   Its very mobility gives safety, for it easily slips away from pressure.   In the third stage, however, it may get somewhat in the way if the placenta has to be extracted.   It may share in the general relaxation of the tissues in the puerperium and be further displaced downward on this account.   Then it may be the cause of uterine subinvolution.   It is accordingly a good rule to replace the kidney immediately after the termination of labor and to see that the wearing of the retentive belt and pad is at once resumed.   There is little probability that operative interference will be needed during pregnancy or labor, but if grave symptoms pointing to strangulation of the kidney arose, then abdominal section would be preferable to the lumbar incision, for it would almost necessarily mean that the kidney was provided with a mesentery.   After the birth of the child the question of operation to fix the organ would arise and might be considered; but from the obstetrician's point of view the matter would be of little moment.   The decision between operation and no operation, and between nephrorrhaphy and nephrectomy, would in all probability be decided apart from obstetric considerations.

MOVABLE KIDNEY.

Movable kidney, by which is meant a lesser degree of renal mobility than that found in the floating organ, has no great importance as a complication of pregnancy and labor.   It has been asserted that it is a cause of dysmenorrhœa and of increased suffering during

pregnancy; but it is more likely that these are the results of the general process of which movable kidney is only one of the signs. Movable kidney is rather to be looked on as a result of gestation than as a complication of it. It is one of a number of changes which find their expression in a greater or less degree of laxity of attachments and downward displacement of the abdominal and pelvic viscera; it is part of the clinical phenomenon which has been described as Glenard's disease, or enteroptosis (expressively if somewhat inelegantly anglicised as "floppy bowels"). It is associated with pendulous abdomen, prolapse of the uterus and vagina, displacement backward of the former organ, a torn perineum, and sometimes actual herniation of the abdominal viscera. It is a nephroptosis. That such a general state of things may be due to tight lacing, to falls and blows, to absorption of the circumrenal fat, and to other weakening causes is undoubted, but that it is chiefly and most constantly the result of child-bearing and especially of frequent and instrumental deliveries is also not to be denied. When we think of the flaccidity of tissues which follows such confinements, of the state of subinvolution and chronic inflammation of a low type of the uterus, and of the too frequently neglected perineal laceration, it is not difficult to understand how the kidney shares in the general loss of tone and consequent displacement. When it is also remembered that movable kidney is most common in working-class women, who have often to rise far too soon after labor and resume their work, the close connection between renal mobility and child-bearing is still further established. Should another pregnancy quickly supervene, the displaced organ will be the source of more or less marked symptoms, chiefly of a neurotic nature, and in the labor the contractions of the accessory muscles and especially of the diaphragm will tend still more to depress the kidney.

That a movable kidney causes symptoms, I do not doubt; but that they can always be differentiated from those due to the flaccidity and relaxation of the other organs is, I think, matter for conjecture. This is easily understood when it is borne in mind that these symptoms are largely of the nature of dyspeptic troubles and nervous manifestations of an hysterical kind. Of course, I do not here refer to the evidences of strangulation of a movable kidney which are clear enough. Such symptoms can hardly be claimed as decisively pointing to any one organ. In the same way I regard a

displaced uterus as capable of producing symptoms, believing, however, that the displacement is only one of the causes of the clinical phenomena. With regard to the pain of a peculiarly sickening kind which pressure over the kidney elicits, it must not be forgotten that a similar symptom is produced by compression of the ovary. Even acute pain and localized peritonitic symptoms do not invariably point to incarceration or strangulation of the kidney, for Edebohls has recently discovered (*American Journal of Obstetrics*, xxxi. p. 161, 1895) that appendicitis is not only a frequent concomitant, but also the direct result, of movable kidney. Whether this be so or not, there can be no doubt that between a movable and strangulated right kidney and appendicitis the diagnosis will often be difficult. This, however, is a matter not falling within the sphere of the obstetrician.

The treatment of movable kidney presents several problems which cannot be said to be yet solved. From the obstetric standpoint the chief possibility is preventive treatment. An extended period of rest after confinement should be insisted upon in maternity hospitals and among the poor; the greatest care should be taken to avoid those infective processes which lead to subinvolution of the uterus and its adnexa; and the immediate repair of the torn perineum should be made a rule. By these means the general relaxation of abdominal and pelvic tissues, which is so productive of visceral displacement, would be largely avoided. When, however, the nephroptosis already exists, we often find it difficult to decide what form of treatment to recommend. If the renal mobility *per se* is the cause of little more than discomfort, the wearing of a well-fitting abdominal belt with a pad over the organ will enable the patient to live almost entirely free from uneasiness. Since it is probable that the absorption of the perinephric adipose tissue is a potent factor in the production of the mobility of the kidney, an attempt should be made by the rest cure to restore this fat, and so fix the organ again. In the experience of C. P. Noble, of Philadelphia, this plan succeeds only with the cases of moderate displacement, and need only be tried in such. In the cases of greater mobility and in those in which the dislocated organ causes grave symptoms the operations of nephrectomy and nephrorrhaphy have to be considered. The former is chiefly to be thought of in sudden emergencies, as when signs of renal strangulation are present, although even then

Edebohls and others have shown that much may be done by attempts at manual reposition, and when it is evident that the kidney is distinctly morbid, as in hydronephrosis. Nephrorrhaphy, on the other hand, is the conservative operation; it does not entail the loss of any renal tissue, and it has proved fairly safe and largely satisfactory. It must, of course, be remembered that, like a hysterorrhaphy or a perineorrhaphy, it does not restore the normal tone of the tissues; it artificially fixes the parts operated upon, leaving the general condition of relaxation alone. Nevertheless, just as these operations have frequently proved sufficient in prolapse of the uterus, so nephrorrhaphy may be expected to succeed in removing the outstanding symptoms associated with nephroptosis. Anything that at the same times gives tone to the relaxed structures will be a useful adjuvant. The repair of the perineum, the curettage of a subinvoluted uterus, and the rest and massage treatment will all act beneficially in this manner. It is beyond the purpose of these remarks to discuss the technique of nephrorrhaphy; but I may say in passing that the method of suturing the kidney in the loin proposed and successfully carried out by F. S. Watson, of Boston (*Journal of Cutaneous and Genito-Urinary Diseases*, xiv. p. 275, 1896), is well worthy of trial. Let me again state that from the obstetric point of view movable kidney is most often to be regarded as but one of the manifestations of the general state of relaxation and flaccidity of the tissues in the abdomen and pelvis to which attention has been so frequently drawn by Glenard and which has for symptoms a train of phenomena chiefly of a neurasthenic kind.

MISPLACED KIDNEY.

Misplaced kidney, by which is meant a kidney displaced and fixed in its wrong position, is to the obstetrician a far more serious matter than either the floating or the movable organ. It is commonly, although not always, a congenital condition. I have in my possession now the pelvis of an infant in which the left kidney is seen lying in an almost fixed position over the left sacro-iliac synchondrosis; had this child lived till she reached a child-bearing age, the misplaced kidney would undoubtedly have proved troublesome. The abnormality, however, is generally associated with other anomalies, especially of the intestines, and in the case above referred to the child showed also foetal rickets in a marked form. The

favorite position of the kidney is over one or other of the sacro-iliac synchondroses, or over the first and second segments of the sacrum, or resting on the sacral promontory. Sometimes both kidneys are displaced, and occasionally they are fused into a horseshoe-shaped mass which may override the promontory. From the clinical standpoint their most important character is the greater or less degree of fixation in the abnormal position which they possess.

That a misplaced kidney may prove a serious complication in labor is shown by such cases as that reported by Albers-Schönberg (*Centralblatt für Gynäkologie*, xviii. p. 1223, 1894), in which the left kidney lay over the promontory and in the cavity of a pelvis of a rachitic type, and in which spontaneous rupture of the uterus occurred during the confinement. Runge (*Archiv für Gynäkologie*, xli., Hefte 1 und 2) has met with a case in which both a kidney and a dermoid ovarian tumor were found in the pelvis along with the gravid uterus; ovariotomy was performed at the fifth month, and labor was induced near the full term; both mother and child were saved.

The diagnosis in such cases must always be a matter of difficulty. The physical examination of the pelvis will, indeed, at once reveal the presence of a mass in one or other of the positions above named; but that this swelling is renal in nature is a matter not so easy to settle. Its size and shape are of little service, for the misplaced kidney is often malformed, and may be also abnormally large or small. The absence of one or both kidneys from the normal position in the flanks will of course be strong confirmatory evidence that the pelvic tumor is renal. The presence of a kidney in the normal position cannot be taken as a proof that a mass felt on the same side in the pelvis is not kidney, for Gill Wylie (*New York Journal of Gynæcology and Obstetrics*, i. p. 186, 1891) found an abnormally shaped kidney under the right broad ligament, and yet there was a kidney in normal position on the right side; the left organ, however, was absent from the loin.

When the presence of a misplaced kidney is detected during pregnancy, it will probably be found desirable to induce labor before the full term; but each case will have to be decided on its own merits and after consultation with another medical practitioner. An attempt will naturally be made to push the kidney up above the pelvic brim, and this may sometimes, if not often, succeed. In try-

ing to carry this out, however, it should be borne in mind that in most of these cases the vascular connections of the organ are abnormal; not infrequently the renal artery is quite short and springs directly from the aorta near its bifurcation. If the condition be detected only when labor is in progress, an attempt may again be made to push the swelling upward. If it lie over one of the sacroiliac joints, the oblique diameter of that side will be shortened (as in the Naegele pelvis), and the fœtal head will probably be found lying with its long axis in the oblique of the opposite side. Under such circumstances labor may possibly terminate naturally or be brought to a conclusion by the aid of forceps. When, however, the kidney lies over the sacral promontory greater difficulty will be experienced. Turning will be found to be preferable to forceps, as being less likely seriously to injure the misplaced kidney. The case is really comparable to one of flat pelvis, and should be treated on the same lines. Symphyseotomy may prove of the greatest service when version or forceps in themselves are insufficient. Delay in the second stage must be specially avoided if we would save the patient from uterine rupture. It is wonderful to what extent even solid tumors in the pelvis can adapt themselves in labor so as to allow a child to pass; but it is not wise to trust too much to this. If the infant be already dead, craniotomy will probably be preferred as the safest thing for the mother; but if the child be alive and other means of treatment not effectual, Cæsarean section should be attempted to give both mother and fœtus a chance. In even the best hands, however, misplaced kidney will always prove a serious complication of pregnancy and labor.

Ophthalmology.

A CONSIDERATION OF THE ESSENTIALS OF IN-TERNAL SQUINT AND THE DIAGNOSIS BE-TWEEN FUNCTIONAL AND PARALYTIC DEVI-ATIONS.

CLINICAL LECTURE DELIVERED AT THE JEFFERSON HOSPITAL.

BY HOWARD F. HANSELL, M.D.,

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GENTLEMEN,—The subject to which I invite your attention this morning is well worthy of your thoughtful consideration. My re-marks are necessarily limited to a superficial survey and a compari-son of the cases with one another, and will be mainly directed to the stimulation in your minds of the desire to master the subject by subsequent study. We will analyze together the history and symp-tomatology of the four cases before you, each one illustrating a dif-ferent variety of squint.

CASE I.—A woman, aged thirty-three, married. Since August the upper lid of the right eye has drooped; the eye has been turned outward so that a wide expanse of sclera is exposed on the nasal side; the pupil is small, irregular in outline, and fixed; the pupillary area of the lens capsule is covered in great part by old inflammatory exu-dation, excluding from view the parts posterior to the lens. The eye is entirely covered by the drooping lid, which can be raised only by the finger. The cornea is widely diverged and capable of only an insignificant rotation upward, inward, or downward from its fixed divergent position. Volition to move the eye results in a slight oblique rotation only, or in still further divergence. When the lid is raised the diplopia is crossed,—that is, the false image of this light, or that seen by the divergent eye, is on the opposite side and on a level with that of the true image, excepting to the extreme

right, when it becomes lower than and farther from it. When the light is carried to the left side the false image approaches the true, but never fuses, because the patient's nose cuts off the extreme left field. The cornea cannot be rotated inward, downward, or upward because the internal inferior and superior recti and the inferior oblique muscles are paralyzed. The slight rotation upward and outward shows that the function of the superior oblique is preserved, and the eye moves outward because the external oblique is not involved. In this case the condition of the nerve supplying the ciliary muscle and the iris cannot be determined, since the pupil is fixed from old iritis and the vision is too low to estimate the range of accommodation. There is, however, very little doubt that these muscles do not functionate.

Diagnosis.—Total paralysis of the third nerve of the right eye from pressure by a gumma in the course of the nerve between its superficial origin and entrance into the orbital cavity. Our suspicion of syphilis is justified from the nature of the ailment, its monocular character, and the marks of old iritis, and is confirmed by the admission of the patient. Other causes may be safely excluded. Albumen and sugar are absent from the urine. There are no indications of posterior spinal sclerosis, no history of traumatism, and no cerebral symptoms. If the gumma was in the orbit we would have complications, such as paralysis of other muscles, proptosis, and pain; if nuclear, the disease must have been of longer standing, and the history would be that of successive involvement rather than complete and simultaneous paralysis, the consensual light reaction of the left pupil would be lost, and other muscles of the left eye and perhaps of other parts of the body would be crippled.

Case II. is a boy of seventeen, who states that he has been cross-eyed since infancy. This is probably an inaccurate statement, for it implies either a paralysis of one or both external recti from congenital defect of the muscles or of the sixth nerves, or traumatism suffered during birth, and either supposition is incorrect. With both eyes open he fixes with the left and always converges the right; but if I cover the left he brings the right up into position so that the image of the object looked at is formed on the fovea of that eye, even if I carry the candle past the middle line over to the right side.

Functional as distinguished from paralytic strabismus is charac-

terized by (1) absence of diplopia, because while the squinting eye is functionally capable it is inactive. Its field is as large as that of the fixing eye. Indeed, under some circumstances, such as looking at an object thirty to forty degrees to its own side the squinting eye is substituted for the fixing, but under ordinary conditions the image of the squinting eye is suppressed. In paralysis diplopia is always present. (2) In the effort to prevent the annoyance of diplopia in paralysis the head is rotated by the neck muscles in the direction of the paralyzed muscles. In functional squint the head is held erect. (3) In paralysis the eye can be rotated only as far as the median line, or, if paralysis be not complete, the affected muscle will contract by a series of jerks and partially effect an external rotation. In functional squint the outward rotation, particularly if the other eye be closed, will be complete or nearly so. (4) In paralytic squint the vision is equally good; in functional, that of one eye is frequently better than the other.

This patient illustrates the monocular form of strabismus. Please do not understand that the affection is confined to one eye, as the term might imply, for the very essence of convergence is in the implication of both,—a want of normal co-ordination; but one assumes the burden of both, or, in other words, one eye always fixes and the other always squints. Close examination of the direction of the deviation of the visual axis of the strabismic eye demonstrates that it is not only rotated inward, but also upward. This obliquity is constant in hypermetropic strabismus, and is the resultant of the combined action of the muscles that are overstimulated to contraction,—namely, those supplied by the motor oculi. The relation of hypermetropia to abnormal convergence may be thus briefly outlined. In order that an image may be accurately defined on the retina of the hypermetropic eye the accommodation is brought into play by which the antero-posterior axis of the ball is lengthened and the refraction of the eye increased. This constant overaction of the ciliary muscle demands a corresponding overaction of the iris, which is contracted, of the inferior and superior recti, and of the inferior oblique, which are also contracted, because all of them are supplied by the third nerve. That the cornea is turned upward and inward and not directly inward can be readily proved by forcing the patient to recognize the image of the squinting eye, in many cases long suppressed. Thus, compel the attention of the brain to that image

by so changing and dulling that of the fixing eye that it will take cognizance of both simultaneously. Cover the fixing eye with a piece of cobalt glass. Its image is reduced in size and no longer yellow, but red and blue. The brighter-colored false image will be seen indistinctly and transiently at first, clearer and more permanent later, so that the patient will admit its reality and will locate it on the same side as the squinting eye and below that of the true image. The degree of deviation can now be learned by adjusting, first, a prism base down before the squinting eye until the false light is elevated to a level with the true, and, secondly, another prism, base out, of sufficient refracting power to fuse the two lights, the degrees of prism measuring the downward and inward deviation respectively.

Case III. illustrates a second variety of functional strabismus, the concomitant or alternating as opposed to the constant or monocular. The difference between the two forms is that, while in the former one eye only is used for fixation and always the same eye, in the latter either eye is used indifferently, since the vision is practically the same. This patient has moderate acuity of vision in the distance and near, but complains of pain and headache in all near work. These symptoms are due to the error of refraction and not to the anomaly of convergence. The determination of the degree and kind of deviation is made, as in Case II., by forcing the patient by repeated and diversified examinations to acknowledge diplopia. This is far more rapidly obtained than when one eye is amblyopic, and often at the first trial. While fixing with the right eye the image of the left will be found below and to the left side; with the left, that of the right below and to the right side. Here both the inward and upward squints are transferred, showing the resultant of the action of the muscles under the control of each third nerve.

A consideration of the ultimate reasons of the two forms of strabismus, in the absence of any pathologic differences that can be detected by careful scrutiny, would be unprofitable. We confess that we know the subject only in its clinical and not in its pathologic aspect. One boy sees equally well with either eye, the other fairly well with one and badly with the other, yet we cannot account for this difference, but present the same hypothesis in explanation of both,—hypermetropia; and this is doubtless correct as far

as it goes. We confess the limitations of our theoretic knowledge and pass on to the consideration of two questions of practical importance, treatment and prognosis. In the first case the result of operation can only be cosmetic. We may straighten the crooked eye, but we cannot restore the vision. Binocular fixation is impossible of attainment, and it is extremely doubtful—even if perfect muscular function results from operation—whether the sensibility of the retina and nerve and of the cerebral centre can be improved. But in the second case operative interference will, in the majority of cases, not only cure the deformity but will also give binocular fixation for all distances. If we can institute treatment early in life, say from three to four years, the constant use of atropia in both eyes—thus holding the accommodation in abeyance over a period of many months in the cases of alternating squint; or the paralysis of accommodation of the good eye, forcing the child to use the amblyopic eye in fixed squint—will not infrequently ameliorate or even correct the deviation. After all I have said concerning the relation of hypermetropia to internal squint, endeavoring to impress upon your minds the utter uselessness of attempting to cure without correcting the hypermetropia, it seems unnecessary to add that in *all* cases, without exception, the estimation of the error of refraction must be carefully made and a full or nearly full correction ordered. This treatment alone may be sufficient to straighten the visual lines and give perfect binocular fixation. But when the patients have reached the age that these boys have, the muscles are set in their positions and no permanent improvement can be hoped for without surgical means. What operation shall be done,—advancement of the externi or tenotomy of the interni? Our experience this winter with advancement alone has not proved satisfactory. I have operated on several cases before you with the object of determining whether advancement can be substituted for tenotomy, and I regret to say our results have not been favorable. In monocular squint my plan is to divide first the superior rectus of the squinting eye, then a double tenotomy of the interni, and finally, if necessary, advancement of the externus of the squinting eye. In the alternating form we have found that complete division of each internal tendon without disturbing the lateral fibres or the supporting tissue of the capsule of Tenon or wide division of the conjunctiva gives the best results. Extensive division of the tendon and

neighboring tissues is to be deplored, since the power of inward rotation will be permanently and seriously impaired, and in the course of some months the eye will become divergent.

CASE IV.—In conclusion, I wish to direct your attention for a few minutes to a case illustrative of the last remark, and show you a most pronounced instance of divergence as a result of tenotomy. This woman, aged thirty-five, was operated on when a young girl for internal squint. Each muscle and its adjoining tissues were extensively divided under general anæsthesia. I would strongly urge you not to tenotomize under ether when possible to avoid it, because it is essential to success that you should have the patient's co-operation, in order that you may inform yourself of the effect you are producing during the process by means of the relative positions of the false and true images. In this manner each step of the operation is taken advisedly. In this patient the divergence is equal to that of paralysis. She cannot rotate either ball inward past the median line. You will observe the scars of the tenotomies and the sunken internal canthi. Vision in each eye is normal. She does not complain of diplopia, nor does she see double images, because the visual axes diverge so far that rays of light proceeding from an object looked at with one eye barely enter the pupil or fall so far on the periphery of the retina of the other that they are not perceived. We can hardly hope to restore binocular vision, but can materially improve the deformity. We will divide each external rectus, then pick up the interni, the adjoining conjunctiva, capsule, and scar tissue, and advance them as close as practicable to the cornea by introducing a strong silk ligature through the tissues far back in the internal canthus, bare the sclera close up to the corneal limbus, insert one end of the suture through the conjunctiva above, the other through the conjunctiva below the cornea, and tie them together, allowing the knot to fall at the inner end of the horizontal diameter of the cornea. By this rather crude but effective advancement we may hope to secure a good result.

Laryngology, Pharyngology, Rhinology, and Otology.

A NOVEL METHOD FOR THE USE OF DRY HEAT IN MIDDLE-EAR DISEASE, OTALGIA, ETC.

BY E. L. VANSANT, M.D.,

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GENTLEMEN,—The local use of dry heat has long been justly regarded as a valuable therapeutic agent in treating inflammations of the ear, otalgia, etc.; these applications in the form of hot salt- and bran-bags, or hot water-bottles, however, are usually only made to the external ear; the actual amount of heat, therefore, coming in contact with the external auditory canal and membrana tympani is necessarily slight. It has often occurred to me, while treating various forms of ear-diseases, that the direct application of heated dry air to the drum-head and middle ear would be desirable, provided we had an apparatus whereby the degree of heat could be regulated and by the aid of which it could be readily obtained and applied. Such an apparatus I now have, and having found it to answer the desired purpose, I beg now to present it to your consideration. It is a modification of an instrument which was first devised for the purpose of dental surgery. It consists of a metallic bulb or barrel containing a piece of carbon, a rubber hand-ball air-compressor, and a long, pointed, steel nozzle. The bulb (or barrel) is heated sufficiently by being held over a flame, preferably that of a spirit lamp; a current of air is then forced through it by means of the hand-ball, thus delivering a small stream of heated air from the nozzle of the

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instrument, which is directed against the spot which is to be treated. The degree of heat produced can be regulated by the length of time the bulb is held over the flame, and also by the distance between the mouth of the nozzle and the surface towards which the heat is directed. The original instrument I have modified by making the nozzle straight instead of curved, and by attaching a handle so that the air from a compressed air-reservoir can be used. In applying the heated air to the ear, a hard-rubber speculum may be used through which the current of air is directed.

I have used heated dry air applied in this manner in quite a large number of cases representing various forms of ear-disease, and can recommend this instrument in suitable cases.

In otalgia of all forms, by its aid I have usually succeeded very promptly in relieving the patient's suffering.

In the so-called dry treatment of otorrhœa, I have found it a valuable adjunct. My method of applying the dry treatment is to thoroughly remove the secretion with sterilized cotton, then dry the moist surfaces with heated air, and follow this by insufflating a powdered medicament. The heated air used in this manner was found to be very grateful to the patient; it not only dries the middle ear, but I have frequently noticed that it seemed to drive out some retained gas.

In the sharp recurring pains that frequently follow the rupture of the drum-head during an acute otitis media, the application of the hot air has given almost instant relief.

I have not used the method in many cases of acute otitis media, but when I have done so the patients were considerably relieved from pain.

The effect of the hot-air current upon the course of an acute otitis media is a matter to be determined by further experience. In chronic purulent otitis media I have noticed a decided stimulation of the mucous membrane and an increase of reparative action.

In treating catarrhal conditions of the Eustachian tube and middle ear, the heated air may be directed through a hard-rubber Eustachian catheter. I have also used the treatment in a number of throat and nasal diseases, and I am able by means of a long, curved, hard-rubber nozzle to force heated air into the trachea, and perhaps even lower into the air-passages; it is my intention, however, to make this the subject of a later communication.

MYCOSIS OF THE TONSILS; NASAL MUCOUS POL-YPI; INTUMESCENT RHINITIS; MEDIASTINAL TUMOR.

CLINICAL LECTURE DELIVERED AT THE RUSH MEDICAL COLLEGE.

BY E. FLETCHER INGALS, A.M., M.D.,

Professor of Laryngology and of Diseases of the Chest in Rush Medical College, Chicago.

GENTLEMEN,—About five weeks ago this man had some slight trouble with the throat, for which he came for treatment. He stated that he had never been subject to sore throat, that there was no pain, and that he had no inconvenience excepting from occasional collec-tions of mucus. He had accidentally discovered something unnatu-ral in the throat. There was no inflammation, and the tonsils were not enlarged, but a number of small yellowish-white patches were found upon both tonsils. This condition still remains. The patches are from one to five or six millimetres in diameter and from two to six millimetres in length. They are firmly attached to the mucous membrane, and are found to be quite hard when grasped by the for-ceps, appearing to be about midway in consistence between a papil-loma kept constantly moistened and a wart upon the integument. Some of these are distinctly papillary, and others have no special form. This case is similar to the one which I showed you a few weeks ago, in which both tonsils were pretty well covered with nu-merous yellowish-white patches. The affection came on insidiously, and was only discovered by accident. There are only two conditions of the throat at all likely to cause the appearance that we see in this case,—viz., follicular tonsillitis and mycosis of the tonsil. As I went into this subject quite thoroughly in a recent lecture, I will merely state at this time that in follicular tonsillitis we generally have some enlargement of glands; the collections of secretion which give the yellowish-white masses are found within the crypt instead of being attached to the surface, and they may generally be easily

pressed out with a probe or washed out with an atomizer. Again, follicular tonsillitis is apt to be attended by abnormal sensations in the throat much more pronounced than in this case, and it is likely to have a history of frequently recurring acute inflammation of the tonsils. As these symptoms and signs are absent in this case, we have no hesitancy in pronouncing it mycosis of the tonsil. We will recommend that the throat be gargled with a solution of carbolic acid, a drachm and a half to the pint of water. We might recommend various other gargles astringent or antiseptic in character, but it is very doubtful whether they would do any good excepting to prevent offensive odor of the breath. I have never seen any treatment of real value that did not completely destroy the mycotic patches. I presume that chemical caustics would accomplish this in time, but I am accustomed to employ the galvano-cautery, with which I am confident we can effect a cure. We will apply to the tonsil three or four times a spray of a ten-per-cent. solution of cocaine and then touch four or five of the patches with a galvano-cautery point about an eighth of an inch long and of similar width, heated to a white heat. The burn should not only destroy the patch, but should be carried into the mucous membrane about two or three millimetres.

After the cauterization the patient will be directed to use the carbolic acid gargle already suggested, and the cauterization may be repeated two or three days after all soreness disappears, which will probably be four or five days from the present time; thus we will go over the whole surface and cure the disease. What the course of this affection if left to itself would be has not been determined, but as I said in a recent lecture, I have had some reason to think that it might sometimes recover spontaneously, though I have never had the opportunity of watching a case where the patient was willing to wait for the unaided efforts of nature.

NASAL MUCOUS POLYPI.

CASE II.—This woman, forty-nine years of age, tells us that eight years ago she began to have obstruction in the nose, which gradually increased until 1893, when she came to the dispensary and had a number of mucous polypi removed. The nasal cavities remained very free for several months, but then she began to note slight obstruction, which has gradually increased so that for the last six

months she has had a great deal of difficulty in breathing through
the left naris, although the right is comparatively free.   Upon ex-
amination with a strong reflected light, we find several polypi
crowded together in the upper two-thirds of the left naris, but with
only two or three projecting lobes that students might recognize
as distinct tumors.   These have a grayish, translucent appearance
characteristic of the mucous polypus, but other portions of the mass
are of a deeper pink color than most polypi that have not been
operated upon.   In the upper part of the right naris we find a single
polypus about the size of a large pea.   In both sides the polypi ap-
parently spring from the middle meatus just external to the middle
turbinated body.   In this disease numerous remedies have been
recommended by spray, such as alcohol, terebene, and various astrin-
gents, or to be applied by means of the probe or hypodermic syringe,
such, for example, as nitrate of silver, chromic acid, or carbolic acid,
but I doubt whether any of them do any real good.   I have some-
times thought that spraying the parts with terebene or alcohol after
the polypi had been removed had some influence in preventing recur-
rence of the growth, but I have never been able to convince myself
even upon this point.   I am certain, however, that it is useless to at-
tempt to treat patients having any number of polypi, or one or more
large tumors, by these methods, and in a case like the one before us
nothing short of surgical interference can be of any value.   Among
the operations recommended for the removal of polypi may be men-
tioned passing a strong cord through the naris into the naso-pharynx
and out of the mouth, and attaching to it a sponge two or three
times the normal size of the naris.   The sponge is then pushed up
into the naso-pharynx and drawn forcibly through the nasal cavity.
Although this procedure would doubtless dislodge some of the
polypi, it is too clumsy and inefficient to be recommended.   The
treatment commonly adopted by the general surgeon is to grasp the
base of the polypi with polypus forceps and twist them off.   In all
the operations of this kind that I have witnessed the patient has been
placed before a window, or in some other equally poor light, and
the surgeon has passed his forceps into the nose, guiding it as best
he could by instinct to the upper part of the nasal cavity, where he
has grasped whatever came between the blades and torn it off.   This
method is sometimes attended by brilliant results, and I remember
several years ago to have seen ten or a dozen large polypi pulled

from the nose in this way at a single effort. After tearing polypi
out in this way the patient is directed to blow the nose, and if the
air passes through freely the operation is considered complete; if
not, the forceps are introduced again and again until other polypi
and very often the turbinated bodies have been torn away. This
operation, I need hardly say, is not in vogue among laryngologists,
and I hope none of you will ever attempt to seize a polypus in the
nose by any instrument when you do not see it distinctly. It would
be only by the merest chance that a complete operation could be
done in this manner, so that the patient might be almost certain that
the growth would return within a few months. The galvano-cau-
tery écraseur has been recommended for removing polypi, and some-
times it answers an excellent purpose, but when there are several
tumors present it is generally impossible to place the wire close to
the base of any of them, and to cut through the middle of a tumor
even with a galvano-cautery is not likely to destroy it; therefore,
this instrument should be reserved for cases in which there are but
few, or small, polypi that can be easily secured. By far the best
method of operating is by means of the cold wire snare while the
nasal cavities are brightly illuminated by reflected light. Numerous
modifications of the polypus snare have been made, any of which
may be used satisfactorily by those who are accustomed to them,
but I prefer a snare bent at an angle of about forty-five degrees with
a tube not more than three millimetres in its outside diameter and
flattened at the end. This is attached to a handle twelve centi-
metres in length, upon which slides a finger-bar to which the wires
are attached; at the lower end of the handle is a ring for the thumb.
Between the finger-bar and the end of the handle, to which the tube
is fastened, a milled wheel fully an inch in diameter runs upon the
handle. The snare should be armed with a No. 5 piano wire for all
ordinary operations. A smaller wire than this is too easily bent and
cannot readily be carried up about the base of the polypus, whereas
a larger one is so stiff that it cannot be easily manipulated in the
nasal cavities. Before beginning the operation the parts should be
thoroughly anæsthetized with cocaine. When there are not many
polypi the parts can be thoroughly anæsthetized, but if the nasal
cavities are filled, it is difficult to get the solution up about the base
of the tumors. Therefore, in such instances it is better to remove
those polypi that can be easily reached first, and to defer further

operation to a subsequent sitting in order to avoid pain. An extra amount of cocaine cannot be satisfactorily applied after the blood has once started, but in the majority of cases, if the application has been carefully made at first, all of the polypi that can be seen may be removed at one sitting with little if any pain. I use for the purpose of producing anæsthesia a four-per-cent. solution of cocaine in combination with other remedies which appear to me to largely prevent its constitutional effects. At least, since employing this mixture I do not get unpleasant symptoms once where I used to get them ten times when using the cocaine alone. The formula that I employ contains one-tenth of a grain of atropine, one-fifth of a grain of strophanthin, three minims of oil of cloves, ten grains of carbolic acid, and twenty grains of the hydrochlorate of cocaine to the ounce of distilled water. I commonly apply it in these cases by means of a hypodermic syringe with a silver nozzle ten centimetres in length; this is bent with a curve at the extremity to enable me to carry the solution close about the base of the polypus. The hypodermic syringe should have a milled wheel upon the piston to regulate the amount injected in each place. In applying the anæsthetic the end of the syringe should be carried up beside the back part of the polypus to the roots of the growth, and about half a minim of the solution should then be thrown out; it should then be drawn forward about five millimetres and a similar amount again injected, and so on until the solution is applied upon both sides of the polypi throughout the whole extent of their attachment. A sufficient quantity will run down upon the sides of the nares to anæsthetize these parts. Eight or ten applications will usually have to be made in this way, and about ten minutes' time will be required.

The operator should have at hand thirty or forty applicators wound with absorbent cotton. The patient's clothing should be covered by a rubber apron and the operator's clothing should be protected from spattering blood, and the patient is given a basin to catch the blood. I will now introduce the wire loop in a vertical direction between the polypus and the septum; carrying it back as far as seems desirable to enclose the tumor, the under edge of the wire is turned outward, and then with a slight antero-posterior motion the loop is pressed upward as far as possible towards the roots of the growth; the wire loop is now tightened by drawing upon the finger-bar until the polypus is firmly held. Now, instead of cutting

through the polypus, I tear it off by steady traction upon the snare. In this way I get down to the roots of the growth, whereas if I cut it off the base would generally be left. Occasionally, as we make traction upon the polypus we find by the resistance and cracking that the snare has enclosed so large a base that if we were to pull it out forcibly we would bring the middle turbinated body with it. In such instances the loop should be tightened so as to cut through, and if any portion of the base is left it should be removed subsequently. In order to facilitate the operation, it is best to have two or three snares, and to have an assistant who will push back the wire and straighten out the loop of the instrument that has been used while the operator proceeds. It is well also to have an assistant hold the patient's head, otherwise much time will be lost by slight movement which causes the operator to lose his view of the parts. When a portion of the polypi has been removed in this way the nose should be swabbed out with the absorbent cotton until other polypi can be clearly seen. It is a waste of time to attempt to seize anything obscured by blood. With a common Argand gas-burner and a proper reflector there is no difficulty in illuminating the deepest recesses of the nasal cavity, so that there is no excuse for working in the dark. I have been more fortunate than I had anticipated in removing nearly all of the polypi from the left side at the first attempt (the remaining polypi were then quickly removed, and the patient expressed herself as having suffered very little pain). I have now removed all of the tumors that can be seen, even though the blood has been carefully wiped away; yet it is probable that when this person returns, in five or six days, other polypi will appear, some of which may be nearly as large as these we have just removed. Such tumors have been compressed and crowded up out of sight by the lower growths, but will fill with serum and descend to view in a few days. We will order for this patient a spray of a third of a grain of thymol, three minims of the oil of cloves, and ten minims of terebene to the ounce of liquid albolene, to be used freely three or four times daily. It is probable that one or two more sittings will be required to free the nares of all the polypi that may come down within the next few weeks, and that at the end of five or six weeks some of the tumors will have begun to grow again. At that time any buds that are apparent should be thoroughly destroyed with the galvano-cautery. Subsequently the patient ought to be seen every two or

three months to prevent recurrence. In a considerable number of cases a single thorough operation effects a cure, but I think in over fifty per cent. repeated cauterizations are necessary to prevent return of the tumors. I think it well for the patient to continue the spray we have just ordered for several weeks, or possibly months.

INTUMESCENT RHINITIS.

CASE III.—This young woman comes to us complaining of difficulty in breathing through the nose, the left side of which, she says, is almost completely obstructed. She tells us that she has nasal mucous polypi for which she has been operated upon twice in the last two years, after each of which operations she obtained considerable relief. The nasal duct of the left side is also partially closed, so that whenever she takes cold tears run over the left cheek, but she has no annoyance from this source to-day. Upon opening the right nostril and reflecting in a good light, I find that the naris has a cavity even larger than natural, but upon looking straight backward in the left side I find the cavity free for about an inch, then a bend in the septum towards the left occurs, and a little back of this the turbinated body is considerably swollen, so that the cavity appears to be nearly occluded; but by turning the speculum to the side I find that a circuitous passage about an eighth of an inch in width (which is the normal calibre) extends through the nose. Nevertheless, the patient has difficulty in breathing, for the draft of air will not readily turn about an obstruction. The surface of the turbinated body is slightly nodular and irregular, indicating hypertrophy or showing the result of former treatment. From her history and the appearance of the parts I conclude that two years ago she suffered from intumescent rhinitis, which was temporarily relieved by cauterization or by the removal of some part of the turbinated body, for she says "at least once something was taken out of the nose," though she cannot tell what.

Stimulating or astringent applications would do this patient no good, and sedative sprays would give but little relief; nothing, indeed, can give permanent benefit excepting surgical measures, and in the condition of the parts cauterization is the only thing to be recommended. This might be done with acids, but it is much better for the patient's comfort and the ultimate result to use the galvanocautery. The inferior turbinated of the left side will be anæs-

thetized by rubbing over it five or six times in the course of as many minutes thin pledgets of cotton which have been dipped in the solution of cocaine that we used before operating upon the previous patient. As soon as the anæsthesia is complete a knife-like electrode, the blade of which consists of No. 21 platinum wire about three-quarters of an inch in length, will be passed through the nostril to the back of the naris and turned upon the turbinated body; the electric current will be turned on to bring the wire up to a bright-red heat, and the instrument will be drawn slowly forward with a slight back and forth movement sufficient to cut through the tissues and touch the turbinated bone in two or three places between its posterior and anterior ends. This linear cauterization will be about five or six centimetres in length, as deep as the tissues covering the bone, and about three millimetres in width; but when healing has taken place the scar will not be more than a millimetre in thickness. This first cauterization will be made at the junction of the middle with the lower third of the turbinated body, and after three or four weeks another cauterization will be made at the junction of the middle and upper thirds. These will probably be sufficient to prevent further swelling, and thus remove the mechanical obstruction which is the sole cause of this patient's annoyance. In treating such cases I am heartily in favor of one or two, or possibly more, linear cauterizations the whole length of the turbinated body, made sufficiently deep to fasten the mucous membrane down to the bone. I do not favor numerous small cauterizations, and I can but condemn large superficial cauterizations which destroy much mucous membrane. Cauterizations made as I have recommended will leave fully as much healthy mucous membrane in the nares as should be there normally, whereas large superficial cauterizations, either by the galvano-cautery or acids, cause cicatricial masses from which normal secretions do not take place, and as a result the patient's condition is worse after the treatment than before it was begun. By judicious and sufficient cauterization as I have here recommended I believe that at least nineteen out of twenty, and sometimes I think as many as ninety-nine out of a hundred, of these cases of catarrh can be cured, but it is best, as soon as the cavity appears of natural size, to desist from operative treatment, even though some further cauterizations may be necessary in a year or two.

MEDIASTINAL TUMOR.

CASE IV.—This man, who is forty-one years of age, comes to us complaining of tickling in the throat and under the sternum, with some shortness of breath, which he says has been annoying him for the last six weeks. He has worked at his trade as a carpenter until six weeks ago, and says he has not suffered from any sickness excepting pleurisy of the left side, which annoyed him for a few weeks fifteen years ago, but did not cause shortness of breath, and la grippe five or six years ago, which lasted a few days. He is well nourished and his general appearance is that of a man in health. Upon further inquiry he speaks of the sensations under the upper part of the sternum as soreness but not actual pain. The pulse is 76, small and soft, and appears to be smaller upon the left than upon the right side, though the difference, if any, is not decided. His temperature is 100° F. He is slightly hoarse, and becomes short of breath upon walking rapidly or climbing stairs, though when sitting quietly there is no dyspnœa. There is a slight hacking cough. His digestion is fair, the bowels regular, and the urine normal. The form of the chest is natural, but the movements of the left side are considerably less than those of the right. Palpation and percussion show that the apex of the heart extends two centimetres to the left of its usual position. The percussion note at the right of the sternum and over the upper part of this bone is natural, but at the left of the sternum, between the upper border of the second rib and the lower border of the third rib, there is slight dulness extending four centimetres to the left of the edge of the bone, and there is apparent though not distinct dulness fifteen millimetres farther.

Although the respiratory movements of the left side are clearly deficient, I am unable to demonstrate dulness over this side either anteriorly or posteriorly, excepting in the small region I have already mentioned at the base of the heart. In listening over the apex of the heart we find both sounds slightly muffled, but there is no distinct murmur or even a sound that might be called an impurity. Over the base of the heart we can detect nothing abnormal excepting quite an intense accentuation of the second sound in the second intercostal space close to the left edge of the sternum. The heart-sounds have a quality sometimes spoken of as galloping. The respiratory sounds over the right lung are normal, but the respiratory sounds

over the left lung, although of normal pitch and quality, are not more than one-fourth as intense, either anteriorly, posteriorly, or laterally, as over its fellow. An examination of the larynx shows paralysis of the left vocal cord.

The restricted movement of the left side may possibly be accounted for by the pleurisy from which he suffered fifteen years ago, though a pleuritic effusion at that time sufficient to have crippled the lung to this extent should have caused marked dyspnœa, from which he says he did not suffer, and it is probable that this symptom would have been present more or less throughout the intervening years. He tells us that he has had no difficulty in breathing until within the last six weeks. Therefore, from the history we are inclined to exclude pleurisy, and from the absence of flatness we can exclude pleuritic effusions at the present time, and from the absence of dulness we may exclude fibrosis of the lung which would have resulted from protracted compression by pleuritic effusion. We are therefore forced to the conclusion that the collapse of the left lung is due to obstruction of its main bronchus, either by something within it or by pressure from without. We do not obtain any history of the patient having inspired any foreign body, nor do we obtain any râles over the lungs, even during the most forcible acts of respiration, therefore we conclude that there is nothing within the bronchus. We are now brought to the question, What is pressing upon the main left bronchus? Four answers are suggested,—viz., an enlarged bronchial gland, a malignant tumor, a mediastinal abscess, or an aneurism of the aorta. Enlarged bronchial glands usually cause severe paroxysmal coughing not much unlike whooping-cough, and is much more apt to occur in children than in adults, and whenever the glands are of considerable size proper percussion will usually elicit dulness in the interscapular space about the level of the fourth dorsal vertebra. This patient coughs very little, and we were absolutely unable to discover any dulness posteriorly, therefore the evidences of an enlarged bronchial gland are slight. A mediastinal abscess is less likely to cause pressure upon a bronchus and interfere with the respiratory movements than it is to cause a tumor presenting externally, and it is apt to be attended by considerable deep-seated pain, with chills and fever, indicating suppuration.

This patient has no real pain, and we get no history of chills, though the thermometer shows a little elevation of temperature.

Malignant mediastinal tumors may occur at any time from youth to old age. I have observed them in a boy less than twenty and in a man of sixty. They are apt to be associated with some enlargement of the cervical glands and to be attended by marked cachexia. In most cases, sooner or later, they give evidence of pressure upon the trachea, the œsophagus, or the bronchi, and they may possibly interfere with the circulation, through one or other of the radial arteries. They are likely to be attended by pain. In this case we have no enlargement of the cervical or other superficial glands, there is no evidence of cachexia, the patient has no pain, and there is no evidence of pressure excepting upon the recurrent laryngeal nerve of the left side and possibly upon the subclavian artery. The evidence is not sufficient to enable us absolutely to exclude tumors of this character, but it is far from sufficient to justify us in making a diagnosis of malignant tumor. Among the more prominent symptoms and signs of aneurism of the aorta are persistent burning or boring pain with neuralgic exacerbations, hoarseness due to pressure upon the recurrent laryngeal nerve with paralysis of the cord, which is more commonly upon the left side, inequality of the radial pulse of the two sides, and a pulsating tumor in the course of the aorta, yielding dulness and commonly attended by distinct bruits. In this case we have paralysis of the left vocal cord due to pressure upon the recurrent nerve, we have collapse of the left lung due to pressure upon the main bronchus, and we have apparent inequality of the radial pulse upon the two sides, all of which point strongly towards aneurism; but the patient suffers no pain, which is certainly an unusual condition in aneurismal growth; there is but slight dulness at the left of the sternum, though this would be perfectly compatible with an aneurism of the descending arch of the aorta; there is no bruit heard upon auscultation, yet in my experience the bruit is absent in fully fifty per cent. of the cases of thoracic aneurism. Aneurisms seldom occur before the forty-fifth year, but some are found in early life, and this man is forty-one years old, so that it would not be surprising if his arteries were already in a condition favoring dilatation. There seems to be more evidence of an aneurism than of other disease, yet it does not account for the temperature, and there are several of the prominent symptoms and signs lacking. I have no hesitancy in saying that this patient has a mediastinal tumor, but I find myself unable to determine its exact nature.

I am inclined, however, to the belief that it is either an aneurism or a subacute inflammation of the glandular and cellular tissue in the region of the left bronchus, and on this theory I shall prescribe for him the iodide of potassium in combination with the chloride of calcium, and we will be obliged to wait and watch results.

NOTE.—The patient was given seven and a half grains of the iodide of potassium and ten grains of the chloride of calcium; he returned in a few days, and it was then shown that he could not tolerate the iodide of potassium in that dose. It was subsequently reduced to about three grains and the chloride of calcium was increased to fifteen or twenty grains. This he took continuously for four or five weeks, during which time the respiratory movements in the left lung became freer, but the hoarseness became more pronounced, until finally the patient was unable to speak above a whisper. The temperature within a couple of weeks ran up to 102° F., but subsequently fell to 99° F. The apparent difference in the radial pulse of the two sides continued, being at some times more distinct than at others; his general health continued good and he expressed himself as much improved, and assured me that he could breathe more easily. Two months later the area of dulness at the left of the sternum extended beyond the mammillary line and from the second rib to the diaphragm. The heart had been crowded an inch and a half to the right. There was no abnormal bruit over the heart or arteries, and very little pain. The patient thought his breathing better, but there was in reality less movement of the left lung on deep inspiration. Aphonia continued. The skiagraph showed an opaque area extending from the second rib to the diaphragm and from two inches to the right of the sternum to the left border of the chest.

Dermatology.

SOME CASES OF LOSS OF HAIR.

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ALOPECIA.

GENTLEMEN,—This patient comes to us on account of loss of hair, and you can see that the hair is gone from the top of the head. On feeling his scalp and hair, the first thing that strikes me is that the hair is very dry, and it has a very wiry feel when you take it in your fingers. This peculiar sensation that the fingers experience is one that is met with in progressive fall of the hair, and also in a parasitic disease called favus. We find that the scalp is also more or less red, and covered with seborrhœa. The seborrhœa and the baldness run along together.

I do not believe every person with seborrhœa becomes bald, but I do believe that there are some families in which alopecia is very prevalent, and when members of it get seborrhœa they are very apt to have their hair fall out rapidly. On the contrary, a person belonging to a strong-haired family may not lose his hair, though he has dandruff or seborrhœa for years. Besides that, I believe seborrhœa occurs in some people whose hair is growing rapidly. Very often you will find that babies, when their hair is thin, have little dandruff, but when the hair has begun to grow thicker they will have a great deal of dandruff. And some people who have had a fever, or some disease that has caused the hair to fall out, will not have much dandruff when the hair is thin, but when it comes in again and is very thick and heavy they will have a great deal of dandruff; and so I believe there are two forms of seborrhœa,—one which causes

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a loss of hair, and the other which seems to do no harm, but is rather a physiological process and rights itself in time.

Yesterday we had a man here who had two kinds of alopecia at the same time, and I spoke to you about his scalp. This man's scalp is quite movable, much more so than the other man's was, and it is not so closely drawn down on the bones. The hair in this case has not fallen out from atrophy of the scalp, but from seborrhœal dermatitis. He is twenty-four years old, and first noticed the falling of the hair six years ago. His family all have strong hair. He has been well during this time until last summer, when he had erysipelas in the face. The hair has fallen out more rapidly since then. You will often find that after some disease of the scalp or a fever the hair falls more rapidly. Since he was eighteen years old the hair has been gradually growing less. This man's father and brothers had heavy heads of hair, but considerable dandruff. He will probably tell you, if he has noticed carefully, that the hair that comes in is much finer than the hair that fell out. This thinning of the diameter of the hair continues until by and by the fine hair is all that is left. You see on the forehead he has some very fine hairs. After a while these fine hairs will fall out, and then still finer ones will come in, and so at last he will have no hair at all.

The prognosis of this case is bad. Here we have progressive falling of the hair for six years, that has gone so far as to destroy all the hair on top of the head. No internal medicine would do him any good. We can do nothing more than to take care of his general health and see that he is out of doors a great deal. The best crops of hair I ever saw were on "the blue-coat boys" in London. In this school they have a peculiar uniform which the boys have to wear. It is very striking, and there is a cap which goes with the uniform that the boys do not like to wear, so they don't wear it, but go all about the streets of London bareheaded, and they have the most magnificent heads of hair you ever saw. Their hair is constantly exposed to the sunlight and wind and weather.

The next thing is to employ an expert masseur, but as you cannot get that skilled talent outside of a very few places, you have to do the next best thing,—that is, instruct the patient to pinch up the scalp between the finger-tips of the opposing hands, and to do that for five minutes night and morning. Persisted in, it will do a great deal of good in stimulating the hair.

The best thing to use locally is a form of sulphur.   Sulphur seems to be *the* remedy for all sebaceous diseases, and while it is an old remedy, it is certainly an efficient one.   But it is offensive to use on account of the odor.   You can, however, have it put up with some scent, and it will not be so bad.

You will see that what little massage I have done while talking makes the scalp red, which persistently remains.

Very often you will find a man who has a bald head but a very heavy beard; and so it is often said that all the strength of the hair has gone into the beard; but, of course, that is all nonsense.   The beard has grown upon the face which is well supplied with blood-vessels, and on account of more nutriment has made a much more vigorous growth, because it had just the conditions to grow well. Sometimes when people grow extremely old the beard falls out, as well as the pubic and axillary hair.

You will often find, too, that when a man has falling of the hair his father or some of his father's brothers—some one on the paternal side—has had the same thing.   Or, if it is a woman, you will often find that her mother or some one of her mother's sisters, or perhaps even farther back than that,—it may be her grandmother,—had falling of the hair.   On the other hand, you will find that there are families who have very heavy hair running right along from generation to generation in the same way.

This man I would recommend to massage the scalp for five minutes night and morning, and to use a sulphur ointment on the scalp, composed of one drachm of flowers of sulphur to an ounce of cold cream.   Do not have it smeared on the hair, but rubbed into the scalp.   I cannot promise him much, but it is worth trying to save the little hair he has.   It is possible that he may be able to increase the apparent amount of hair by stimulating what he has to a more vigorous growth.   To accomplish any good he must persist, not for weeks, but for months.   Indeed, he must make up his mind to give attention to his scalp for the rest of his life.   We may remove dandruff, but, as it is parasitic in many if not in most cases, we must expect reinfection and reproduction of the disease.

ALOPECIA AREATA AND RINGWORM.

Here are two cases, a man and a boy, that are most instructive. You see that both of them have something the matter with the scalp.

The hair is off in bald spots,—that is, in definite, circumscribed areas. You see that this man has two kinds of alopecia. He has ordinary alopecia that comes with advancing years or with some disease of the scalp that causes large bald areas on the temples or on the whole top of the head. But, not content with that variety of the disease, he must needs get up another variety of alopecia, and you see the circumscribed spots of baldness known as *alopecia areata*.

This boy, also, has bald spots on his scalp, and they are rather of circular shape; and the question is whether he has the same disease as the man, or ringworm. Of course, alopecia areata is quite common in children, more so, perhaps, than it is in adults. I have no hesitancy at all in the man's case, because I know that ringworm of the scalp does not occur in adults; or, at any rate, it is so rare that we will leave it out of the diagnosis entirely. So, putting that aside, alopecia areata is the only other form of baldness that develops in circles, therefore nothing else is left but the diagnosis of alopecia areata. You find that the scalp is perfectly smooth, it feels a little thin, there are no scales, no broken-off hairs, although you may find some dots in the scalp which are the hair-roots left behind when the hair falls out. After a while they fall out also. In the boy's case I find that while his scalp is not scaly, the patches are scaly, and I find also that instead of a perfectly smooth surface characteristic of alopecia areata, I detect a little roughness by rubbing the finger-ends over them. Though you cannot see the broken-off hairs very easily, the peculiar feel of the ends of the hair when you pass the finger-tips over the patches would make you sure that it is *ringworm*, even if your eyes were shut.

These cases are excellent for purposes of differential diagnosis. In ringworm you have a patch that is not perfectly smooth, but shows scales and broken-off hairs, and even when you cannot see the broken-off hairs you can feel them by passing the fingers over the patch against the growth of the hair. The microscope will show the trichophyton fungus.

In alopecia areata you have a bald patch. Perhaps a few hairs may be in the patch, and little dots, but not broken-off hairs. The scalp is perfectly smooth, is not at all scaly, and under the microscope you will not find the trichophyton fungus.

For a long time alopecia areata has been the subject of a very lively discussion among dermatologists. Some say that the cause

is a trophoneurosis. There is no doubt that after injuries about the head the hair does fall out, and after an injury to the cervical ganglion of the cat the hair will fall off its head.

It is very rare that you can trace any case of alopecia areata to a source of contagion; but, on the other hand, there have been cases of epidemics of alopecia areata that you cannot possibly question. Several cases have been reported in England and France. There are cases reported all the time in the army barracks among the French soldiers. We have to concede, then, that it must be contagious.

One reason why we cannot trace its source of contagion better is that men who go to barber-shops go to so many different ones. There is no question that the barber is the means of disseminating many diseases. The hair-brush he uses on the head filled with dandruff and loose hair of one customer is used on the next customer without any attempt at cleansing it. We all have dandruff, more or less, and it is no wonder. The barber's towels are kept in the very worst way. When soiled, instead of being boiled, they are simply passed through the mangle and then put away damp in a warm drawer. Of course, such methods only aid the growth of fungi. You should always instruct your barber as much as you possibly can in the use of antiseptics.

What shall we do for this man's alopecia? First, a word in regard to the ordinary baldness. If you put your hand on his scalp you will find that it is pretty closely bound down to his skull. In alopecia there is a progressive atrophy of the subcutaneous tissues of the scalp, which binds it down to the skull. Can we do anything for ordinary baldness? If your patient is a woman, you can do a great deal, because she takes pride in her hair, and will carry out your directions. Men never have so much pride about it. They will come to you and say, "I don't want to be bald, at least not until after I get married." They don't seem to think it will make any difference whether they have any hair or not after they are married. When you tell them what to do, they don't do it, because it takes time and trouble.

You cannot make the hair grow on this man's receding temples, but if he has a mind to really take care of the scalp, he can preserve the hair he has and make more grow after a while. You hear, of course, about hair tonics, but, as I have said, when there are a great many remedies for any one trouble, you may be sure that none will

do very much good. What can you do with hair tonics? They generally contain alcohol and cantharides. If you use the latter too strong you are liable to cause severe inflammation of the patient's scalp and so make mischief. The great reputation that so-called hair tonics have comes principally from women. There is something peculiar about a woman's hair. It will often fall out without apparent cause, and then grow in again. They use hair tonics on the hair, and will recommend them to others, telling how much they have been benefited, when the fact really is that their hair would have come in again, anyway. In fact, the most that hair tonics do is to keep the scalp clean. There are only two remedies that are worth anything; one is massage. That I know is good, for I have seen its effect. If you are not where you can procure a skilful masseur or masseuse, or if the expense is too great, you can do a great deal yourself. Pinch up the scalp between the finger-tips of the opposing hands for five minutes night and morning. This will loosen the scalp, promote the secretions, and the hair will become stronger and thicker.

The other remedy is a parasiticide. I prefer a preparation of sulphur,—say one drachm of sulphur loti to an ounce of cold cream. This will check the falling of the hair and cure dandruff.

Now, in regard to the alopecia areata. That is a self-limited disease, and in the course of time the hair will come in again, in most all these cases; but you can stimulate it by massage. Another good thing to use is the stronger water of ammonia. It is pretty lively, and may redden the surface of the scalp. Blistering over small areas is another remedy.

CASE OF ALOPECIA AREATA.

It is very easy to make one diagnosis of this case, that is baldness, for here we have complete loss of hair. When you look at the scalp closely, looking across the top of the head, you can see there are a number of fine lanugo hairs that are trying to crop out. You notice as soon as you touch the scalp how movable it is. You can see the eyebrows are beginning to fall out also. This is a case of the same kind as the previous one,—*alopecia areata*. This is one end of the scale, and that was the other. This is what is known as the malignant form. This child has had the trouble for three years. She would probably tell you, if you should ask her, that it

began as round patches of baldness and spread until the hair gradu-
ally all fell out. Then it grew in again, to fall out once more. This
may be the second or third relapse of the disease. In this case it has
fallen out once before. It was out about six months, and then came
in again and stayed in about a month, and then fell out. It usually
remains longer than that. This is one characteristic of alopecia
areata. It occurs as a series of relapses extending over varying pe-
riods. In some cases the hair falls off from the entire body, and you
cannot find a vestige of it. You can see how deforming it is to have
no hair or eyebrows. Sometimes a man's beard will all fall out, or so
much of it that he has to have what is left shaved off in order to look
respectable.

    These are the cases that the parasitic theory of the disease does
not explain. It is very hard to make a case like this fit into the class
of parasitic diseases because it seems incredible that the hair will all
fall off the whole body inside of a few days or weeks on account of
any parasite acting from without. Such cases support the neurotic
theory, and I believe there are some cases that are due to a neurosis
and some that are due to parasites. The symptoms are exactly the
same. Different causes may produce the same result. Thus we
have ring-shaped patches due to such widely differing diseases as
erythema multiforme, seborrhœa, and trichophytosis.

    The prognosis of a case of this sort is very uncertain. The
younger the individual is the more prone is he to have a return
of hair. A patient should never lose courage with respect to the
return of the hair, for even after it has been out two or three years,
it may come in again.

    The prognosis is better in this case than in some cases, because
we have a history of hair coming in, though it did not stay very long;
but that shows that there is some hair-forming capacity left in the
hair papillæ.

    Now, in regard to the treatment of a case of this sort: it is chiefly
a matter of experiment. You can try a great many different things,
and you may be rewarded by a return of the hair and you may not.
Galvanism may be used, but it is by no means entirely satisfactory,
although electricity in some cases has been used with success. One
case I knew where the hair had been out for a number of years that
came in again partially under static electricity. Painting with can-
tharides may be used, making a blister. What you want to do is

to use a stimulant in the hope that you can induce the hair to grow in. Perhaps the use of the stronger water of ammonia is about as good as anything.

Children should be taken out of school and kept out in the open air, doing what you can to build up the general condition, in the hope that when the condition is restored to normal, the hair will come in again.

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